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Vol. 1054 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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May 7, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

May 7, 1985 Volume 1054 Number 1

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JUN 10 1985
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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
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GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 25/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

Note that the amount of the international search fee for the European Patent Office will change effective May 7, 1985 and the amounts of the International PCT fees will change effective May 28, 1985. For information on these fee changes see the notice appearing in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	No charge

Mar. 20, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on May 4, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,327,447 through 4,328,591

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years, the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,311,076, Re. S.N. 719,558, Filed May 24, 1984, Cl. 84/001, ELECTRONIC MUSICAL INSTRUMENT WITH HARMONY GENERATION, Thomas E.

Rucktenwald, et al., Owner of Record: *Whirlpool Corp., Benton Harbor, Mich.,* Attorney or Agent: Albert L. Jeffers, Ex. Gp.: 217

4,457,960, Re. S.N. 718,245, Filed Apr. 1, 1985, Cl. 428/035, POLYMERIC AND FILM STRUCTURE FOR USE IN SHRINK BAGS, David L. Newsome, Owner of Record: *American Can Co., Greenwich, Conn.,* Attorney or Agent: Stuart S. Bowie, Ex. Gp.: 154

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,523,889, Reexam. No. 90/000,751, Requested: Apr. 3, 1985, Cl. 210/713, METHOD AND APPARATUS FOR SEPARATING LIQUIDS FROM SOLIDS, Frederick G. Eis, Owner of Record: *American Sugar Co., New York, N.Y.,* Attorney or Agent: Elmer S. Albritton, Ex. Gp.: 310, Requester: Eimco Process Equipment Co., Salt Lake City, Utah

3,862,861, Reexam. No. 90/000,747, Requested: Mar. 28, 1985, Cl. 429/57, MAINTENANCE-FREE TYPE LEAD ACID, Donald H. McClelland, et al., Owner of Record: *Gates Energy Products, Inc., Denver, Colo.,* Attorney or Agent: C. Castleman, Ex. Gp.: 110, Requester: Yuasa Battery Co., Ltd., Tokyo, Japan

4,042,890, Reexam. No. 90/000,749, Requested: Mar. 28, 1985, Cl. 330/207A, HIGH EFFICIENCY ELECTRICAL POWER CONDITIONER, Joseph S. Eckerle, Owner of Record: *Joseph S. Eckerle, La Honda, Calif.,* Attorney or Agent: Townsend & Townsend, Ex. Gp.: 250, Requester: Hewlett-Packard Co., Palo Alto, Calif.

4,231,105, Reexam. No. 90/000,754, Requested: Apr. 11, 1985, Cl. 364/900, VENDOR CONTROL CIRCUIT, James T. Schuller, et al., Owner of Record: *UMC Industries, Inc., Stamford, Conn.,* Attorney or Agent: Senniger, Powers, et al., Ex. Gp.: 237, Requester: Unidynamics Corp., St. Louis, Mo.

4,408,081, Reexam. No. 90/000,753, Requested: Apr. 9, 1985, Cl. 568/571, PROCESS FOR OXIDATION OF ISOBUTANE, Elton G. Foster, Owner of Record: *Shell Development Co., Houston, Tex.,* Attorney or Agent: Ronald L. Clendenen, Ex. Gp.: 120, Requester: Owner

4,446,113, Reexam. No. 90/000,752, Requested: Apr. 3, 1985, Cl. 422/267, BENZOPYRANS, John M. Evans, et al., Owner of Record: *Beecham Group P.L.C., Brentford, Middlesex, England,* Attorney or Agent: Jacobs & Jacobs, Ex. Gp.: 134, Requester: Owner

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U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage fand may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF COMMERCE

SN 6-400,571 (4,499,770). SYSTEMS FOR MONITORING CHANGES IN ELASTIC STIFFNESS IN COMPOSITE MATERIALS.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-399,257 (4,500,637). PREVENTION OF GRAFT VERSUS HOST DISEASE FOLLOWING BONE MARROW TRANSPLANTATION.

SN 6-475,215. MULTI-LAYER COIL ASSEMBLY COAXIALLY MOUNTED AROUND THE ROTARY AXIS FOR PREPARATORY COUNTERCURRENT CHROMATOGRAPHY.

DEPARTMENT OF THE AIR FORCE

SN 6-520,356. METHOD AND APPARATUS FOR GENERATING A STRUCTURED LIGHT BEAM ARRAY.

SN 6-624,567. SECURE DIGITAL SPEECH COMMUNICATION.

SN 6-643,138. METHOD AND APPARATUS FOR HIGH SPEED, SUSTAINED RECORDING AND INFRARED LASER BEAM PATTERNS.

SN 6-649,454. APPARATUS FOR RETRIEVING, PLACING, AND STOCKING TRAYS FROM AN AUTOMATIC STORAGE AND RETRIEVAL CAROUSEL.

SN 6-659,484. CARGO HANDLING SYSTEM.

SN 6-675,171. FREQUENCY SELECTIVE SIGNALS-TO-NOISE ENHANCER/LIMITER APPARATUS.

SN 6-680,432. ACTIVE DISPERSION CONTROL FOR A DOPPLER BROADENED LASER.

SN 6-684,240. AUTONOMOUS UNINTERRUPTABLE POWER SUPPLY APPARATUS.

SN 6-686,954. INTERACTIVE COMMUNICATION CHANNEL.

SN 6-689,681. ELECTRON-BOMBARDED SILICON SPATIAL LIGHT MODULATOR.

SN 6-689,699. CHARGE ISOLATION IN A SPATIAL LIGHT MODULATOR.

SN 6-689,736. SABOT/GUN GAS DIVERTER.

SN 6-690,438. VIBRATION ISOLATOR ACTUATOR.

SN 6-698,728. OPTIMIZING HOT WORKABILITY AND CONTROLLING MICROSTRUCTURES IN DIFFICULT TO PROCESS HIGH STRENGTH AND HIGH TEMPERATURE MATERIALS.

SN 6-698,979. WAVELENGTH DEPENDENT, TUNABLE, OPTICAL TIME DELAY SYSTEM FOR ELECTRICAL SIGNALS.

DEPARTMENT OF THE ARMY

SN 6-686,048. DEVICE FOR CONTROLLING OPTICAL FIBER TWIST ON A BOBBIN.

SN 6-699,990. DIELECTRIC RESONATOR.

SN 6-704,816. INJECTION CONTROLLED LASER TRANSMITTER WITH TWIN LOCAL OSCILLATORS.

SN 6-705,267. MONOLITHIC PLANAR DOPED BARRIER LIMITER.
SN 6-707,107. ADJUSTMENT OF THE FREQUENCY-TEMPERATURE CHARACTERISTICS OF CRYSTAL OSCILLATORS.
SN 6-707,346. COMPENSATION OF ACOUSTIC WAVE DEVICES.

DEPARTMENT OF THE INTERIOR

SN 6-488,482 (4,500,329). SELF-ACTUATING VACUUM GAS/LIQUID SEPARATOR.
SN 6-622,515 (4,500,398). PRODUCTION OF LEAD FROM SULFIDES.

PATENT NOTICES

Certificates of Correction for the Week of May 7, 1985

Pp. 5,234	4,446,586	4,472,699	4,486,772
Re. 31,651	4,447,127	4,472,938	4,486,827
Re. 31,693	4,447,704	4,473,066	4,486,919
D. 273,101	4,451,657	4,473,711	4,487,104
D. 274,574	4,452,831	4,473,953	4,487,257
D. 276,393	4,454,486	4,474,037	4,487,276
D. 276,700	4,454,582	4,474,600	4,487,429
D. 276,706	4,454,888	4,474,744	4,487,544
3,938,095	4,455,418	4,474,821	4,487,559
3,993,658	4,457,286	4,474,930	4,487,797
4,110,595	4,458,732	4,476,033	4,487,883
4,262,553	4,459,681	4,476,188	4,488,261
4,265,713	4,460,581	4,476,192	4,488,325
4,276,789	4,460,633	4,476,373	4,488,428
4,333,011	4,460,637	4,476,540	4,489,910
4,338,511	4,460,638	4,476,581	4,490,316
4,341,550	4,460,687	4,478,781	4,490,676
4,349,160	4,460,933	4,478,822	4,490,765
4,353,912	4,461,183	4,478,858	4,490,829
4,360,440	4,461,204	4,478,952	4,491,035
4,366,823	4,461,806	4,479,325	4,491,082
4,368,151	4,462,029	4,479,759	4,491,093
4,389,852	4,462,269	4,479,852	4,491,221
4,390,192	4,462,767	4,479,870	4,491,246
4,393,115	4,462,928	4,480,401	4,491,260
4,401,312	4,462,995	4,480,601	4,491,472
4,405,796	4,463,549	4,481,015	4,491,588
4,407,872	4,463,679	4,481,101	4,491,596
4,408,147	4,463,886	4,481,146	4,491,898
4,410,583	4,464,471	4,481,607	4,492,066
4,414,588	4,465,424	4,481,650	4,492,858
4,414,952	4,465,639	4,481,815	4,493,433
4,420,153	4,466,067	4,482,055	4,493,510
4,420,160	4,466,336	4,482,259	4,493,558
4,420,567	4,466,369	4,483,153	4,493,578
4,420,868	4,468,152	4,483,204	4,494,540
4,423,333	4,468,303	4,483,301	4,494,571
4,425,147	4,468,691	4,483,737	4,494,756
4,430,335	4,470,339	4,483,748	4,495,059
4,431,033	4,470,478	4,484,113	4,495,225
4,431,293	4,470,608	4,484,301	4,496,339
4,434,174	4,471,427	4,484,312	4,496,708
4,435,666	4,471,603	4,484,864	4,497,028
4,435,731	4,471,614	4,485,113	4,499,484
4,439,008	4,471,938	4,485,337	4,501,020
4,441,135	4,472,036	4,485,837	
4,442,451	4,472,225	4,485,923	
4,446,000	4,472,516	4,486,322	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 257
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4243
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 30, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-12-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-28-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-03-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-20-81
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-20-82
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-05-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-22-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-08-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-25-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-21-83

Expiration of patents: The patents within the range of numbers indicated below expire during March 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,371,351 to 3,375,528, inclusive

Plant Patents ..... Numbers 2,797 to 2,801 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MAY 7, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T105,401

PROCESS FOR THE PREPARATION OF COTTON-LIKE TEREPHTHALATE POLYESTER FIBER AND YARNS

Vikas M. Nadkarni, A-6 Pranjali M.G. Rd., Thane, India (400602), and Hyunkook Shin, 134 Hitching Post Dr., Wilmington, Del. 19803

Continuation of Ser. No. 418,524, Sep. 15, 1982, abandoned. This application Feb. 16, 1984, Ser. No. 580,277

Int. Cl.³ D01D *5/22*

U.S. Cl. 264—151

1 Sheets Drawing. 25 Pages Specification

Production of a high-strength, convoluted polyester staple fiber which includes use of a spinneret having a slot aperture having a width of greater than about 0.07 mm, and a length to width ratio of at least 2, spinning at a spin stretch factor of equal to or greater than 100N, where N is the number of elongated slots that make up each outlet orifice, at a spinning speed of greater than about 1500 m/min., drawing the fiber under amorphous retaining conditions by an amount greater than the natural draw ratio, mechanically crimping the fiber, cutting it to staple lengths, and relaxing the fiber 10 to 40%. The fiber is cotton-like. The preferred polyester is polyethylene terephthalate.

T105,402

METHOD FOR POLISHING AMORPHOUS ALUMINUM OXIDE

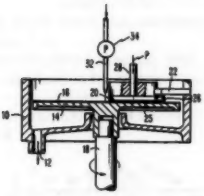
Jagtar S. Basi, 97 Nantucket Dr., Fishkill, N.Y. 12524, and Eric Mendel, 3 High Point Dr., Poughkeepsie, N.Y. 12603

Continuation of Ser. No. 474,120, Apr. 10, 1983, abandoned. This application Apr. 23, 1984, Ser. No. 603,263

Int. Cl.³ H01L *21/306*

U.S. Cl. 156—636

1 Sheets Drawing. 14 Pages Specification



A method for the chemical-mechanical polishing of amorphous aluminum oxide surfaces to a high degree of perfection is described. The aluminum oxide surfaces are continuously wetted with a water-citric acid slurry containing a soft abrasive material. The continuously wiping of the aluminum oxide surface is accomplished with a firm surface using pressure while maintaining a relative movement between the aluminum oxide surface and the firm surface to remove the water reacted aluminum oxide product from the high points of the aluminum oxide surface. This method is continued until a high degree of perfection of the surface is accomplished. The slurry is typically composed of colloidal silicon dioxide dispersed in water containing citric acid.

T105,403

METHOD OF MANUFACTURING A SEALING CAP FOR AN INTEGRATED CIRCUIT CARRYING SUBSTRATE

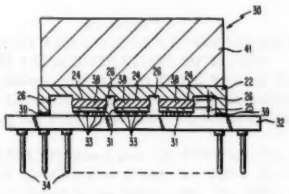
Eric B. Hultmark, 18 Quarry Dr., Wappingers Falls, N.Y. 12590

Continuation of Ser. No. 414,764, Sep. 7, 1982, abandoned. This application Aug. 2, 1984, Ser. No. 636,877

Int. Cl.³ B29C *17/08*

U.S. Cl. 264—23

2 Sheets Drawing. 13 Pages Specification



A cap for sealing a substrate having integrated circuit chips thereon is manufactured by ultrasonically machining a pattern of channels in the top surface of a plate, the pattern of channels defining a plurality of pedestals at locations corresponding to integrated circuit chip locations on the substrate. The pedestal tops are then ultrasonically machined so that each top lies a predetermined distance from the top surface of the plate. Ceramic caps manufactured according to the present invention may be mass produced with precise dimensional tolerances.

T105,404

BENEFICIATION OF PHOSPHATE ORES CONTAINING SURFACE ACTIVATED SILICA

Shuang-shii Hsieh, 1622 Bridlewood Dr., and James R. Lehr, 124 Riverview Dr., both of Florence, Ala. 35630

Filed Sep. 14, 1984, Ser. No. 650,390

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166

No Drawing. 13 Pages Specification

A phosphate ore flotation process comprising subjecting a phosphate ore containing surface-activated silica and silicates to froth flotation in the presence of a fatty-acid collector, recovering the phosphate concentrate from the overflow; removing the fatty acid collector from the phosphate concentrate in the presence of a sulfuric acid deoiling agent; subjecting the phosphate concentrate to a reverse froth flotation in the presence of a silica collector and a modifier, said silica collector being an amine and said modifier being either alkyl diphosphonic acid, or being HF; removing the separated silica from the overflow; and recovering the phosphate product in the underflow. The process of the present invention not only overcomes the problems of activated silica flotation, but also results in greatly improved grade and/or recovery of phosphate product in comparison to present conventional phosphate ore flotation processing.

REISSUES

MAY 7, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,877
AIR INTAKE CONDUITRY FOR A MOTORCYCLE

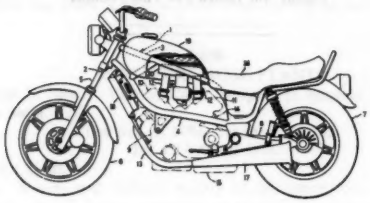
Kazuhiki Nomura, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Original No. 4,319,657, dated Mar. 16, 1982, Ser. No. 78,696, Sep. 25, 1979. Application for reissue Nov. 26, 1982, Ser. No. 444,863

Claims priority, application Japan, Sep. 25, 1978, 53-116695

Int. Cl.³ F02M *35/16, 35/12*

U.S. Cl. 180—219 **7 Claims**



5. In combination: a motorcycle frame; a multi-bank, multi-cylinder V-type engine supported by said frame with its crankshaft extending transversely thereto, a fuel tank supported by said frame, said fuel tank being disposed above said engine and being generally V-shaped, with legs depending downwardly at each side; and air intake conduitry comprising a respective air intake pipe extending upwardly from each bank of said engine, a connecting box defining an inner cavity positioned in proximity to the valley of said V-type engine and contiguous to said fuel tank, said intake pipes all opening into the inner cavity of said connecting box, and an inlet device providing the air inlet to said connecting box, said inlet device being positioned in the area between said valley and said fuel tank and comprising an outlet communicating with said connecting box, an inlet and an air filter element interposed between said inlet and said outlet.

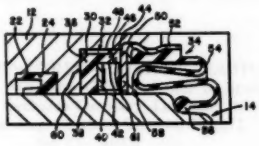
Re. 31,878
DISC BRAKE HAVING A PISTON RETRACTION ASSEMBLY

Irving R. Ritsema, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Original No. 4,382,492, dated May 10, 1983, Ser. No. 248,650, Mar. 27, 1981. Application for reissue Sep. 22, 1983, Ser. No. 535,966

Int. Cl.³ F16D *65/54*

U.S. Cl. 188—71.8 **6 Claims**



1. In a disc brake having a piston retraction assembly, a caliper defining a bore for receiving a piston to substantially form a pressure chamber, the pressure chamber receiving pressurized fluid during braking to move the piston relative to the caliper, the retraction assembly cooperating with the caliper and the piston to substantially control withdrawal for the piston relative to the caliper upon termination of braking and a boot assembly cooperating with the caliper and the piston to isolate a sliding interface therebetween from the environment, characterized by said caliper bore including a recess at the open end, said retraction assembly comprising a friction ring engaging said piston and a resilient member biasing said friction ring to a first position engaging said caliper, said friction ring and said resilient member being disposed within said recess and said boot assembly including a portion extending into said recess to engage said resilient member, said friction ring being movable to a second position in response to movement of said piston to also engage said boot assembly portion whereby said boot assembly portion limits movement for said friction ring, and said friction ring [being substantially L-shaped in cross section with an axially extending leg] forming a radial clearance with an axially extending wall of said recess.

Re. 31,879
METHOD AND ARRANGEMENT FOR MEASURING THE CONCENTRATION OF GASES

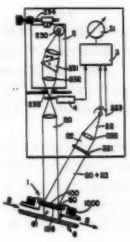
Dietrich W. Lübbers, and Norbert Opitz, both of Dortmund, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Munich, Fed. Rep. of Germany

Original No. 4,003,707, dated Jan. 18, 1977, Ser. No. 661,636, Feb. 26, 1976. Continuation of Ser. No. 2,184, Jan. 8, 1979, abandoned. Application for reissue Jul. 29, 1982, Ser. No. 403,121

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2508637

Int. Cl.³ G01N *21/64, 21/79, 33/84*

U.S. Cl. 436—133 **47 Claims**



28. A method of measuring at least the pH value of a sample comprising the steps of generating a light beam having a predetermined color characteristic; generating light signals indicative of the pH value of a sample to be measured by positioning an indicator having a light-transmissive surface positioned to be impinged by said light beam, a diffusion membrane adapted to be placed in the proximity of a sample and being selectively permeable to a component of the sample which will allow a pH measurement of the sample to be made, and a pH indicating substance which is capable of fluorescing positioned to be impinged by the light beam penetrating said light-transmissive surface and by said component penetrating said diffusion membrane, said pH indicating substance responding when illuminated by said incident light beam by emitting a resultant light beam having a fluorescent emitted component which has a color characteristic different from said predetermined color characteristic and is related to the pH value of the sample; conducting said resultant light beam away from said indicating substance through said light-transmissive surface; and

discriminating said emitted component from said resultant light beam so that the change in the color characteristic of said indicating substance can be measured and correlated with the pH value of the sample.

33. In an arrangement for measuring the concentration of gases in a sample, a combination comprising means for generating a monochromatic light beam having a predetermined color characteristic; indicating means for generating light signals indicative of the concentration of gases in a sample to be measured, including a light transmissive surface positioned to be impinged by said monochromatic light beam, a diffusion membrane of silicone adapted to be placed in proximity of a sample and being permeable to a selected gas component thereof, and an indicating substance sealingly embedded throughout said diffusion membrane and positioned to be impinged by said monochromatic light beam penetrating said light-transmissive surface and by said gas component penetrating said diffusion membrane, said indicating substance reacting when illuminated by said incident monochromatic light beam by emitting a resultant light beam having an emitted component which has a color characteristic different from said predetermined color characteristic; means for conducting said resulting light beam away from said indicating substance through said light transmissive surface; and means for discriminating said emitted component from said resultant light beam so that the change in the color characteristic of said indicating substance can be measured and correlated with the concentration of gases in the sample.

Re. 31,880
Patent Not Issued For This Number

PLANT PATENTS

GRANTED MAY 7, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,458
MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 1, 1982, Ser. No. 344,539
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by bud and flowers similar in color to the variety, Mrs. Aaron Ward, a climbing hybrid tea: plant is easy to grow from cutting or bud.

5,459
MINIATURE ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Sep. 9, 1983, Ser. No. 530,732
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, to spreading, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a cream to soft yellow color which changes to white, the bud and flower resembling the variety Yellow Doll (U.S. Plant Pat. No. 2,450, expired) in form but smaller in size; and further characterized by a plant of vigorous and compact growth habit, with main canes and branches completely thornless, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy to matt foliage and an abundance of flowers borne usually in loose clusters of 3 to 5 or more.

5,460
MINIATURE ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Sep. 9, 1983, Ser. No. 530,731
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, spreading, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a generally orange red color, being of a shade generally near Scarlet 19/1 or lighter, the bud and flower resembling the variety Anytime (not patented) in form with more petals, and slightly smaller size; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy to matt foliage and an abundance of flowers borne usually in loose clusters (or spray) of 3 to 15 or more.

5,461
NECTARINE TREE—ZAIPRIDE CULTIVAR

Chris F. Zaiger, Modesto, Calif., assignor to Stark Brothers Nurseries and Orchards Company, Louisiana, Mo.

Filed Aug. 22, 1983, Ser. No. 525,272
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, characterized by (a) a large, vigorous, and upright growth habit, (b) a relatively low chilling requirement, and (c) the productive formation of good quality, early maturing, medium to large fruit having a high level of red skin coloration and a firm yellow flesh which possesses good eating and shipping qualities.

5,462
NECTARINE TREE, ISLAND DELIGHT

Alan R. Asdoorian, 6384 Chico Ave., and Soren Asdoorian, 522 6th Ave., both of Kingsburg, Calif. 93631

Filed Oct. 3, 1983, Ser. No. 538,139
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, broadly characterized by its bearing of large, yellow-fleshed fruit and by its general resemblance to the unpatented Firebrite Nectarine Tree, of which it is believed to be a mutant, but from which it is distinguished as to novelty by its fruit ripening approximately eight to ten days earlier than the fruit of the Firebrite variety, and by its fruit having a skin covered over approximately 60% to 80% of its surface by a blush color ranging from light red to garnet on a ground color of yellow.

5,463
PEACH TREE — ZAIQUEEN CULTIVAR

Chris F. Zaiger, Modesto, Calif., assignor to Stark Brothers Nurseries and Orchards Company, Louisiana, Mo.

Filed Aug. 22, 1983, Ser. No. 525,835
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by (a) a large, vigorous and upright growth habit, (b) a relatively low chilling requirement, and (c) the productive formation of good quality early maturing and uniform ripening medium to large fruit having a high level of red skin coloration and a firm yellow flesh which possesses good eating and shipping qualities.

5,464
CARNATION NAMED MEDEA

J. F. Sarneel, Nieuwveen, Netherlands, assignor to Milek en Zonen B.V., Nieuwveen, Netherlands

Filed Jun. 29, 1983, Ser. No. 508,863
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation, substantially as herein shown and described, characterized by its profuse and continuous production of very light peach colored blooms, and by its vigorous and strong growth habit producing stong main stems about one meter in length and strong flower stems of medium length.

5,465
DIGITARIA DIDACTYLA GRASS PLANT

Hubert F. Whiting, Fallbrook, Calif., assignor to Amfac Garden Perry's Inc., Ventura, Calif.

Filed Oct. 6, 1983, Ser. No. 539,742
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new variety of *Digitaria didactyla* grass plant herein shown and described by a moderate green color as defined by the ISCC-NBS Centroid color chart; this new variety retains a superior greener color during the winter period by only losing some of its green color, and produces a finer more dense textured surface with a very small amount of thatch buildup; the anthers are a grayish reddish purple as defined by the ISCC-NBS Centroid color chart; the stigmas are of a very dark purplish red as defined by the ISCC-NBS Centroid color chart.

PATENTS

GRANTED MAY 7, 1985

ERRATA

For CLASS	See PATENT NO.
525–036	4,514,947
384–445	4,515,417
384–502	4,515,418
418–001	4,515,512
418–101	4,515,513
418–150	4,515,514
417–026	4,515,515
417–038	4,515,516
417–046	4,515,517
065–171	4,515,621
065–351	4,515,622
424–094	4,515,637
534–635	4,515,716
514–046	4,515,781
514–024	4,515,782
514–027	4,515,783
514–063	4,515,784
514–182	4,515,786
514–180	4,515,787
514–202	4,515,788
514–196	4,515,789
514–234	4,515,790
514–248	4,515,791
514–214	4,515,792
514–252	4,515,793
514–249	4,515,794
514–263	4,515,795
514–303	4,515,796
514–349	4,515,797
514–341	4,515,798
514–341	4,515,799
514–392	4,515,800
514–403	4,515,801
514–288	4,515,802
514–338	4,515,803
514–456	4,515,804
514–460	4,515,805
514–471	4,515,806
514–513	4,515,807
514–521	4,515,808
514–533	4,515,809
514–530	4,515,810
514–554	4,515,811

ERRATA—Continued

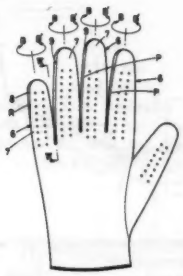
For CLASS	See PATENT NO.
514–592	4,515,812
514–563	4,515,813
514–652	4,515,814
548–237	4,515,946
556–453	4,515,976
360–025	4,516,162
360–032	4,516,163
360–053	4,516,164
360–053	4,516,165
360–072	4,516,166

PATENTS

GRANTED MAY 7, 1985

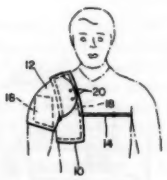
GENERAL AND MECHANICAL

4,514,861
GOLF GLOVES
Toshihiko Kamada, Kagawa, Japan, assignor to Kamatari Co., Ltd., Kagawa, Japan
Filed Jan. 6, 1984, Ser. No. 568,568
Claims priority, application Japan, Jun. 8, 1983, 58-88100[U]
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 A **4 Claims**



1. A golf glove characterized in that the lateral sides of outer and inner wall members of finger compartments thereof are respectively sewn together as twisted in a direction opposite to the direction of and in amount substantially equal to the amount of twist of said finger compartments that occurs with respect to fingers when a golf club is gripped with the glove.

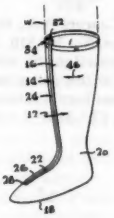
4,514,862
GUN RECOIL PROTECTOR
Anthony A'Costa, 2216 7th Ave., Apt. #301, Pueblo, Colo. 81003
Filed Jul. 25, 1983, Ser. No. 517,102
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—268 **1 Claim**



1. A versatile recoil protector for a user's shoulder during firing a gun, which comprises:

a main body protector portion, said main body protector portion having an inner surface and an outer surface, said inner surface having a padded area of absorption material, said main body protector portion having a horizontal leg portion and a vertical portion, said horizontal portion arranged to extend across a portion of the torso of the wearer from front-to-back under the arm and the vertical portion of said protector is arranged to pass up to and above the shoulder of the wearer, a rectangularly shaped panel arranged to be secured to said horizontal portion of said protector and to said vertical portion along the back side of the wearer above the shoulder, a tubular portion capable of encircling the arm of the wearer and including a front extended portion that overlaps and is affixed to said vertical portion, said tubular portion further being delimited adjacent to the bicep of the wearer and means for securing said recoil protector relative to the shoulder of the wearer.

4,514,863
SOCK
Hoang T. Tuyet-Van, 1921 Beloit Ave., Los Angeles, Calif. 90025
Filed Sep. 13, 1982, Ser. No. 417,460
Int. Cl.³ A41B *11/00*
U.S. Cl. 2—240 **9 Claims**

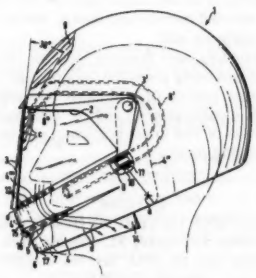


1. A sock comprising:

a sock body which includes a lower portion for surrounding the foot of a wearer and an upper portion for surrounding the lower leg of the wearer; and

a strip-shaped stiffener having an upper stiffener portion attached to said upper sock body portion, and having a lower stiffener portion attached to the lower sock body portion, said lower stiffener portion positioned to lie on the top of the foot of a wearer and extend from the ankle and along most of the distance therefrom to the toes of the wearer's foot.

4,514,864
SAFETY HELMET, ESPECIALLY FOR USERS OF AUTOMOTIVE VEHICLES
Siegfried Huber, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Dec. 6, 1982, Ser. No. 447,099
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148725
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—424 **13 Claims**



6. A safety helmet especially for users of automotive vehicles, comprising a viewing opening, visor means for the view-

ing opening, vent openings terminating into an air-collecting chamber located on the inside of a chin protector, at least one air-conducting channel leading from the air-collecting chamber to the upper zone of the viewing opening and the efflux direction of the air-conducting channel being extended from above obliquely and at an acute angle to the inside of the visor, and

the air conducting channel includes a ventilating tube inserted in the lining of the safety helmet,

wherein the chin protector is removable, the ventilating tubes each having a separating site, and the mutually facing tube ends being associated with cooperating sealing collars.

4,514,865

STEMMED FEMORAL COMPONENT FOR THE HUMAN HIP

William H. Harris, 665 Concord Ave., Belmont, Mass. 02178

Continuation-in-part of Ser. No. 369,510, Apr. 19, 1982, Pat. No. 4,406,023. This application Jun. 20, 1983, Ser. No. 506,103

The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.

Int. Cl.³ A61F *1/04*

U.S. Cl. 3—1.913 **11 Claims**

1. A femoral component for a hip prosthesis for the human hip comprising:

a femoral stem adapted to fit into the medullary canal of the femur, said femoral stem having an upper portion and a lower portion, said upper portion having lateral, medial, anterior and posterior surfaces;

a collar formed on a proximal end of the stem adjacent the upper portion thereof and extending transversely of the direction of elongation of the stem, said collar extending transversely beyond only selected ones of said lateral, medial, anterior and posterior surfaces on the proximal end of the stem, and said collar not extending transversely beyond surfaces of said upper portion of said stem other than said selected ones of said lateral, medial, anterior and posterior surfaces; and

means for bonding said femoral stem to the femur, said bonding means being provided only on said other surfaces of said upper portion of said stem, said selected ones of said lateral, medial, anterior and posterior surfaces and the outer surfaces of said lower portion of said stem being free of said bonding means.

4,514,866

BUOYANT METERING DISPENSER

Richard G. S. Pong, 132 Spring St., Passaic Park, N.J. 07055

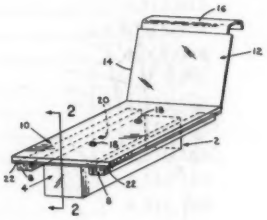
Filed Jun. 10, 1983, Ser. No. 503,000

Int. Cl.³ E03D *9/03*

U.S. Cl. 4—228 **17 Claims**

1. A buoyant dispenser for suspension in a fluid reservoir with a cyclically variable fluid level, for the periodic delivery of a metered quantity of a dispensable material thereto, said dispenser comprising:

A. a container with a central receptacle for holding said dispensable material, said receptacle having a greater longitudinal dimension and having a partition extending transversely to the greater longitudinal dimension of said receptacle, said partition having a height less than the depth of said receptacle whereby the fluid within said receptacle may rise and flow over said partition, and said partition divides said receptacle into a first and a second compartment;



B. buoyancy means communicating with said container and straddling said receptacle;

C. a cover in fluid-tight engagement with said receptacle;

D. attitude guide means, attached to said container and adapted to be anchored to a wall of said fluid reservoir; and

E. metering means in fluid registry with said receptacle to permit the controlled ingress and egress of said fluid, said metering means comprising a first hole located in said cover and a second hole located in said container in substantial axial alignment with said first hole, and in fluid registry with one of said compartments.

4,514,867

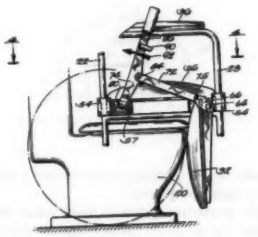
WHEEL CHAIR WITH DISPLACEABLE SEAT PANEL

Neil B. Jensen, W. 339, N. 5175, Rd. O, Nashotah, Wis. 53058

Continuation-in-part of Ser. No. 348,530, Feb. 12, 1982, abandoned. This application Dec. 30, 1983, Ser. No. 567,062

Int. Cl.³ A61G *7/02*

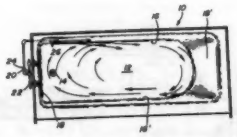
U.S. Cl. 4—480 **5 Claims**

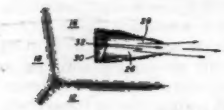


3. A seat assembly for converting and adapting a wheel chair body having generally vertically extending front and rear legs for toilet use said assembly comprising a seat frame having front and rear cross frame members, said cross frame members having end portions adapted for connection to said front and rear legs of said wheel chair two side panels, a central panel, a pivot shaft rigidly connected to said control panel and rotatably housed by said front frame for pivotally supporting said central panel in a contileverid manner to said front frame, linkage means including a handle connected between said front and rear cross frame member and connected to said pivot shaft to accord pivotal movement of said central panel between an

open generally vertical position and a closed generally horizontal position, said frame members including integrally formed vertically extending clamp portions having clamp parts oriented to embrace said vertically extending wheel chair legs to secure said side frames in assembly with a four point connection to the side frames.

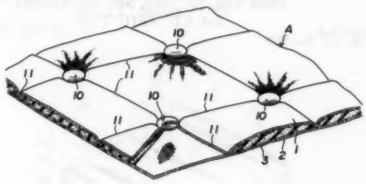
4,514,868
BATHTUB
Jean-Claude Visinand, 3535 Papineau, Apt. 2405, Montreal, Quebec, Canada H2K 4J9
Filed Apr. 27, 1983, Ser. No. 489,046
Int. Cl.³ E03C *1/02*
U.S. Cl. 4—541 **4 Claims**





1. In a bathtub having a bottom wall, a pair of sidewalls and opposed first and second end walls integrally formed with said bottom wall, said second end wall being angularly inclined outwardly to define an abutment surface against which a person lying in the bathtub may rest, and water inlet means connected to hot and cold water supply means for filling said bathtub with a mixture of hot and cold water, whereby the improvement comprises only one of said sidewalls having a flow directing channel defined by an elongated recess, said elongated recess having a longitudinal axis, first and second ends and a transverse end wall at the first end of said recess extending transversely thereto, said recess being near said first end wall on said one sidewall and at a height above the buttocks of an individual seated in the bathtub and being curved in cross-section and tapering toward said second end to merge with said one sidewall in a direction toward said second end wall, and wherein said water inlet means comprises a single water discharge nozzle integral with said transverse end wall and extending therethrough in substantial axial alignment with the longitudinal axis of said recess so as to discharge a flow of hot and cold water along said one sidewall in a direction toward said second end wall and to impart to the water a circulatory movement as the water fills the bathtub, thereby uniformly mixing the hot and cold water and providing a uniform water mixture having a substantially constant temperature.

4,514,869
TOP MEMBER FOR A VEHICLE SEAT
Akira Aoki, and Kunihiko Ito, both of Akishima, Japan, assignors to Tachikawa Spring Co., Ltd., Japan
Filed Aug. 1, 1983, Ser. No. 519,418
Int. Cl.³ A47C *3/00*
U.S. Cl. 5—472 **8 Claims**



1. A top member for a vehicle seat comprising:
a top layer, a wadding and wadding cover laminated to one another;
a rigid button core member having outer circumferential portions interposed at a given interval between said top layer and said wadding or between said wadding and said wadding cover, and wherein
said top layer, said wadding and said wadding cover at the outer circumferential portions of said button core member are annularly adhered to one another by application of heat and pressure to form an integral unit, and wherein
said top layer, said wadding and said wadding cover are welded radially from the annularly adhered portions to provide an integral unit.

4,514,870
FIRE RESISTANT LAP PROTECTION BLANKET
Charles E. Tyler, Jr., Rte. 1, Box 275, Troy, Va. 22974
Filed Sep. 30, 1982, Ser. No. 432,386
Int. Cl.³ A47G *9/00*
U.S. Cl. 5—485 **8 Claims**

1. A fire-resistant blanket adapted for placement in a vehicle upon a seated user's lap to protect clothing from tobacco burns and the like, comprising:
(a) a piece of fire resistant material dimensioned to substantially cover the seated person's lap and clothing to catch debris dropping thereon;
(b) a pocket formed along an edge of the material for receiving and retaining debris collecting on the material, said pocket being operatively attached to the material so that debris can fall into the pocket by gently shaking the material or brushing the debris in the direction of the pocket for containment thereon; and
(c) a layer of heat insulating backing material attached to cover a lower surface of said fire resistant material so as to directly contact and cover the user's lap, said backing material having a high coefficient of friction to prevent

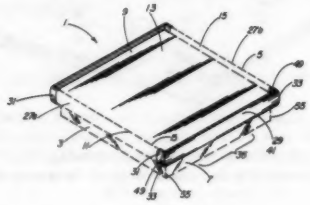
slippage of the blanket from the user's lap, said backing layer being a sheet of foam material.

4,514,871

WATERBED CONVERTIBLE CAP

Susan S. Fisher, and Jared D. Fisher, both of 630 Ave. J, Lake Charles, La. 70601

Filed Aug. 15, 1982, Ser. No. 523,302
Int. Cl.³ A61G *7/10*
U.S. Cl. 5—508 **6 Claims**



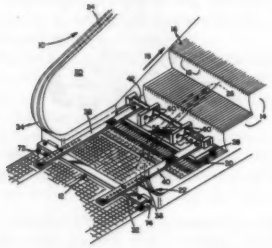
1. A padded rail cap for a water bed, comprising:
an elongated first rail cap means extending in covering relationship substantially the length of a first rail;
a corner cap means extending perpendicularly to the first rail cap means and at least in part covering a second rail, which is attached, perpendicularly, to the first rail;
said corner cap means and said rail cap means meeting in a mitered joint at the point of attachment of two rails; said corner cap means being provided with attachment means to securely, fittingly engage a rail cap means of the second rail.

4,514,872

ESCALATOR TREAD CLEANING BRUSH

Hammond W. Hopkins, 6019 St. Andrews, Dallas, Tex. 75205

Filed Apr. 29, 1983, Ser. No. 489,834
Int. Cl.³ A46B *15/00, 9/02, 9/06*
U.S. Cl. 15—256.5 **15 Claims**



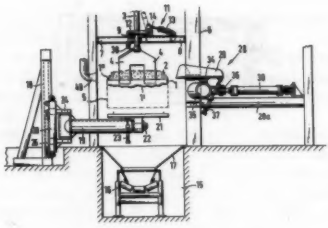
1. An apparatus for cleaning the steps of an escalator, the escalator having parallel rail housings for mounting rails in the escalator, comprising:
a brush bar extending generally perpendicular to the direction of motion of the steps and positioned between the rail supports above a step;
a first set of relatively elongate bristles mounted on the brush bar for extending into the grooves in each of the steps for cleaning;
a second set of relatively short length bristles mounted on the bursh bar for contacting the tread of the steps for cleaning, the first and second set of bristles being slanted from the vertical, the first set of bristles being slanted to assist in easing the bristles into the grooves;
a cross bar for extending between the ends of the rail supports for contacting the ends of the rail supports; and
at least one arm connected between the cross bar and the brush bar for positioning the brush bar above a step and fixing the brush bar relative to the rail housing so that motion of the steps of the escalator causes the sets of bristles to clean the steps as they pass underneath the cross bar.

4,514,873

EQUIPMENT FOR CLEANING REMNANTS OF CARBON BLOCKS

Franz Golla, Lünen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,166
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242285
Int. Cl.³ B08B *1/02*
U.S. Cl. 15—306 B **23 Claims**



1. Apparatus for cleaning bar-mounted remnants of carbon blocks, the apparatus comprising a machining station defining a working position, a breaking device for loosening incrustations adhering to the remnants at the working position, and a transport device for moving the individual remnants into the working position, wherein the breaking device includes at least two blades which are displaceable transversely of the direction of movement of the transport device, each of said blades having a cutting edge provided with at least one recess.

4,514,874

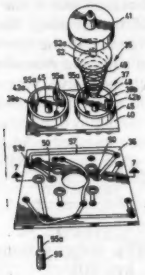
DEVICE FOR AUTOMATICALLY CONTROLLING THE SUCTION POWER OF A VACUUM CLEANER

Gerhard Kurz, Industriestrasse, 7261 Althengstett, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,572
Int. Cl.³ A47L *9/28*
U.S. Cl. 15—319 **16 Claims**

1. A device for the automatic control of the suction of a vacuum cleaner having a motor, a dust container upstream of said motor whereby the suction produced by said motor causes dust to enter said container, and a speed control adjustment means connected to said motor, said device comprising: at least one vacuum-operated switch positioned in the vacuum region of the vacuum cleaner, said switch comprising a housing having an open end, and a diaphragm covering said open end and movable in response to changes in the vacuum, a contact plate in said housing; at least two contacts in said housing spaced at different distances from said plate; lead means connecting said plate and said contacts in circuit with said speed control adjustment means whereby the connection of said plate with said contacts effects variations in the speed of said motor, and

mounting means tiltably mounting said contact plate on said diaphragm, whereby said plate is moved by said diaphragm



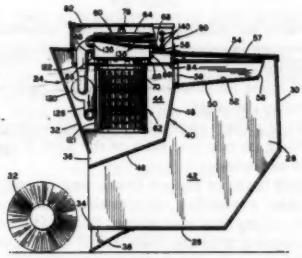
into sequential connection with said contacts in response to increases in suction of the vacuum.

4,514,875

HIGH CAPACITY FILTER FOR FLOOR CLEANING MACHINES AND THE LIKE

Philip L. Comer, Bowling Green, Ohio, assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 16, 1983, Ser. No. 475,718
Int. Cl.³ A47L *11/24*
U.S. Cl. 15—349 **11 Claims**



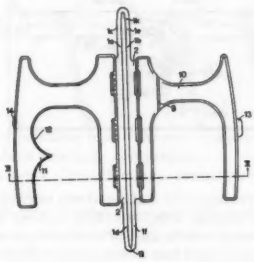
1. In a machine for sweeping a surface comprising a frame, wheel means supporting the frame on the surface, a rotatable sweeping brush carried by said frame, and a hopper carried by said frame near said sweeping brush, said hopper having a dirt- and debris-receiving opening near said sweeping brush through which dirt and debris are received from said brush, the improvement comprising wall means dividing said hopper into a lower dirt- and debris-receiving chamber and an upper exhaust chamber and defining an air inlet opening communicating between said chambers, a manifold in said exhaust chamber, at least one filter extending from said manifold and having a filter medium defining an outer surface and a central chamber communicating with the interior of said manifold, means for removably supporting said manifold in said exhaust chamber, said removably supporting means comprising a supporting frame in said hopper, and supporting plate means supported on said supporting frame under said manifold and supporting said manifold above said supporting frame, and exhaust means having an outlet communicating with the exterior of said hopper and an inlet communicating with the interior of said manifold.

4,514,876

INJECTION MOULDED BAG CLOSURE

Jorn P. Houlberg, Studsgade 40, DK-8000 Århus C., Denmark

PCT No. PCT/DK81/00014, § 371 Date Oct. 13, 1981, § 102(e) Date Oct. 13, 1981, PCT Pub. No. WO81/02284, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 12, 1981, Ser. No. 314,078
Claims priority, application Denmark, Feb. 12, 1980, 598/80
Int. Cl.³ B65D *33/24*
U.S. Cl. 16—110 R **4 Claims**



1. An injection molded plastic closure device for a bag having a mouth, said closure device comprising:

a pair of parallel carrying bars which are attachable to opposite sides of the mouth of the bag, each of said carrying bars having an elongated dimension and a width dimension and each of said carrying bars, when oriented such that its elongated dimension is horizontal and its width dimension is vertical, defining opposite end portions and upper and lower side edges, said carrying bars also defining imaginary vertical planes in their width dimensions,

connector portions integrally connecting the respective associated opposite end portions of said carrying bars along their entire width dimensions, and

closure members respectively connected to the upper side edges of said carrying bars, each of said closure members including a handle part and at least one of said closure members including a flexible connecting part; each said flexible connecting part extending between the associated carrying bar and the associated handle part and each said flexible connecting part being integrally molded with the associated carrying bar to initially extend in a plane perpendicular to the imaginary vertical plane defined by the associated carrying are, each said flexible connecting part including a portion of reduced thickness which forms a weakening line that extends in parallel with the upper edge of the associated carrying bar; and wherein the handle part of each said closure member includes a base wall, inner and outer side walls and an open side, thus forming a U-shaped cross section, the base wall of the handle part of a first of said closure members having a lesser width between its associated inner and outer side walls than the base wall of the handle part of a second of said closure members, such that when said closure members are brought together to close the mouth of the bag, the open sides of the handle parts thereof will face one another and the handle part of said first closure member will fit within the handle part of said second closure member.

4,514,877

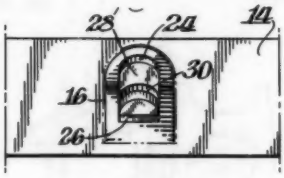
STOVE DAMPER HANDLE

Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.

Filed Feb. 22, 1983, Ser. No. 468,088
Int. Cl.³ G05G *2/10*
U.S. Cl. 16—111 R **7 Claims**

1. A handle for a stove damper comprising an elongated rod having a remote end and a near end, said remote end being

adapted to be secured to the damper whereby movement of said rod causes corresponding movement of the damper, a handle member for being grasped by the user, mounting means securing said handle member to said near end of said rod at a non-perpendicular angle thereto, said mounting means comprising a hollow boss secured to said handle member, said boss having an open face remote from said handle member telescopically receiving said rod therein, means securing said rod to



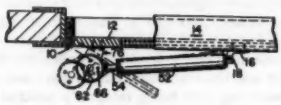
said boss preventing axial and rotational movement of said rod with respect to said boss, said boss having edge means in contact with said remote end of said rod preventing any pivotal movement of said rod with respect to said boss, said boss being of generally U-shaped cross section having an elongated open side area of a dimension at least as great as the width of said rod to permit said rod to be inserted into said boss through said open side area, and said open side area remaining open and exposed after insertion of said rod.

4,514,878

REVERSIBLE ADJUSTABLE TORSION DOOR CLOSER

Walter Arneberg, Anoka, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Sep. 13, 1982, Ser. No. 416,871
Int. Cl.³ E05F *1/08*
U.S. Cl. 16—300 **1 Claim**



1. In combination with a door closer assembly for use with a door, wherein said assembly comprises a cylinder, and a rod extending axially within the cylinder with one end extending therefrom, a torsion spring door closer comprising:

(a) a housing having an engaged end and a nonengaged end, and a top portion, and a bottom portion which is disposed for relative angular movement with respect to the top portion about an axis which extends through the top and bottom portions of the housing, said housing being attached at one of the top and bottom portions to the end of the rod which extends from the cylinder, said rod being disposed for relative angular movement with respect to the portion of the housing to which it is not attached;

(b) a torsion spring having coils which encircle the axis which extends through the top and bottom portions of the housing, wherein one end of the spring is sufficiently fixed against movement relative to one portion of the housing and the other end of the spring is sufficiently fixed against movement relative to the other portion, that the tension of the spring can be varied by the angular movement of one portion relative to the other portion;

(c) a sleeve located inside the housing and around the axis which extends through the top and bottom portions of the housing;

(d) at least two lugs, at least one at each end of the sleeve and extending outside the housing, wherein at least one of the lugs is located at and engages the engaged end of the housing while at least one of the lugs is located at and does not engage the nonengaged end of the housing;

(e) a plate located at the nonengaged end of the housing, said plate engaging said at least one of the lugs located at the nonengaged end of the housing, thus fixing the plate against movement relative to the sleeve;

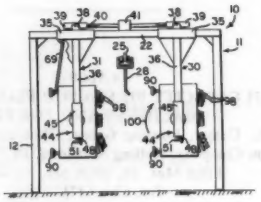
(f) a reversible tension adjusting mounting bracket disposed for engagement with the sleeve, wherein the bracket can engage the sleeve in a variety of positions which correspond to particular strengths of closing force for the door closer assembly when installed, said bracket being fixed against movement when the door closer assembly is installed.

4,514,879

SUSPENDED FEATHER PICKER WITH ROTATABLE SECTIONS

Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands

Filed Jan. 26, 1983, Ser. No. 461,145
Int. Cl.³ A22C *21/02*
U.S. Cl. 17—11.1 R **7 Claims**



1. Apparatus for picking feathers from suspended poultry carcasses moving in succession along a predetermined path of travel comprising:

a support frame for positioning along the path of travel of the poultry carcasses,

two banks of pickers suspended from said support frame for positioning on opposite sides of the path of travel of the poultry carcasses,

each of said banks of pickers comprising a housing with an open side, a plurality of rotatable disks with flexible feather picking fingers supported from said rotatable disks and projecting from the open side of said housing toward the path of travel of the poultry carcasses,

said support frame including means for rotatably supporting said banks of pickers on laterally spaced, horizontal axes extending parallel to the path of travel of the poultry carcasses for rotational movement about the axes sufficient for the open side of each bank of pickers to face in the opposite direction away from the path of travel of the poultry carcasses and away from the other bank of pickers to permit the picking fingers of one bank of pickers to be replaced and cleaned without physical obstruction from the other bank of pickers.

4,514,880

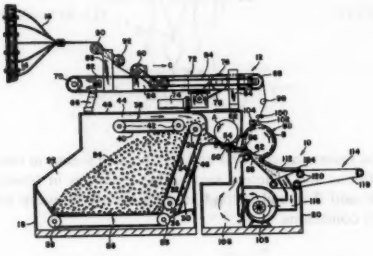
FORMATION OF NONWOVEN WEBS OR BATTS FROM CONTINUOUS FILAMENT TOW OR YARN STRANDS

Edward A. Vaughn, Clemson, S.C., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 7, 1983, Ser. No. 472,829
Int. Cl.³ D01G *1/08*
U.S. Cl. 19—0.35 **8 Claims**

1. Method of forming continuous batts of random fibers comprising the steps of breaking individual filaments bundled into tows at relatively weak points in the filament into seg-

ments which are relatively short but of random length by separating said tows into individual filaments, arranging said filaments on a conveying table in a substantially parallel arrangement, holding said filaments against said conveying table while maintaining said relatively parallel arrangement of the filaments on the conveying table, using said conveying table to move said filaments in said substantially parallel arrangement



toward a rotating lickerin, rotating said lickerin at a surface speed greater than the surface speed of the conveying table, causing said lickerin to grasp said filaments, and, due to the greater surface speed of said lickerin, applying said tensile force to said filaments to break the latter into said segments, doffing said segments from the lickerin, and depositing said segments on a condenser.

4,514,881

METHOD AND APPARATUS FOR REDUCING FIBER BALES

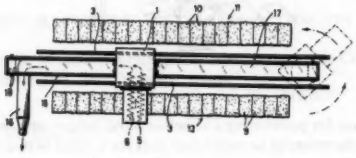
Hubert Hergeth, and Helmut Hergeth, both of Dülmen, Fed. Rep. of Germany, assignors to Hergeth Hollingsworth, GmbH, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,137

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208346

Int. Cl.³ D01G *7/06*

U.S. Cl. 19—80 R **21 Claims**



1. A process for reducing the material of rows of bales of spinning material such as cotton, synthetic fiber material and the like comprising the steps of positioning two rows of bales in side-by-side generally parallel relationship with a space therebetween, spanning one row of the bales with a milling device carried by a frame positioned generally within the space, operating the milling device to remove flocks from the one row of bales while simultaneously moving the frame along the rows with the space, rotating the frame and thus the milling device through generally 180° to transfer the milling device to a position spanning the other of the row of bales, operating the milling device to remove flocks from the other row of bales while simultaneously moving the frame along the rows within the space, and delivering the removed flocks from the one and other row of bales to the space through the frame.

4,514,882

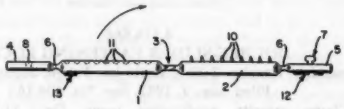
DEVICE FOR RETAINING IN SIDE-BY-SIDE RELATIONSHIP FLEXIBLE TYING MEANS SUCH AS SHOELACES

Christian Lavielle, 59 Chemin de Suzon Résidence du Grand-Chene, 33400 Talence, France

Filed Oct. 26, 1983, Ser. No. 545,505

Int. Cl.³ B65D *63/00*; F16G *11/00*

U.S. Cl. 24—16 PB **6 Claims**



1. A device for retaining in side-by-side relationship flexible tying means such as shoelaces comprising:

a pair of relatively rigid clamping members formed of a plastic material,

a relatively flexible linking member comprising a hinge section of reduced dimension integrally formed with said clamping members and joining said clamping members in such a manner as to permit said clamping members to be folded so as to lie one against the other for firmly retaining said flexible tying means in side-by-side relationship therebetween,

gripping means on the mating surfaces of said clamping members comprising pins on one of said surfaces and corresponding cooperating depressions on the other of said surfaces, said pins being of sufficient size and number as to be able to engage and retain said flexible tying means placed between said clamping members,

means for locking said clamping members together, said locking means being such as to require at least partial destruction of said device for removal of said tying means from between said clamping members, and

said clamping members including severable portions of reduced thickness so as to enable severance of said frangible portions for opening said device and releasing said flexible tying means for use.

4,514,883

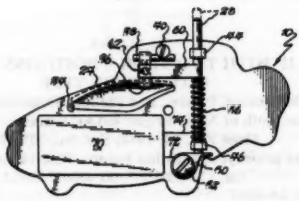
OBJECT-SIMULATING BELT BUCKLE

John J. Barbieri, 756 E. Main St., East Aurora, N.Y. 14052, and Ross C. Oar, Orchard Park, N.Y., assignors to John J. Barbieri, East Aurora, N.Y.

Division of Ser. No. 245,016, Mar. 18, 1981,. This application Dec. 2, 1983, Ser. No. 569,009

Int. Cl.³ A44B *11/00*

U.S. Cl. 24—163 K **2 Claims**



1. A belt buckle comprising:

(a) a body adapted to be connected to a belt for wearing on a user, said body having a structure which simulates a known object;

(b) an operator member carried by said body in a manner

permitting movement of said member relative to said body in response to manual operation; and

(c) sound generating means carried by said body and operatively connected to said operator member for providing an audible sound output in response to movement of said operator member, said sound generating means having a structure for providing sound selected to have some relation to the known object being simulated by said body structure.

4,514,884

DOUBLE-SLIDER FASTENING LOCK

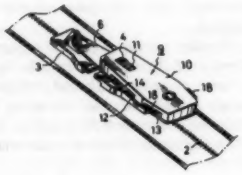
Katsukichi Kaneko, 2-20-9, Daito-ku, Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,163

Claims priority, application Japan, Dec. 21, 1981, 56-189350[U]

Int. Cl.³ E05B *67/38;* **A44B** *19/26*

U.S. Cl. 24—386 **4 Claims**



1. A double-slider fastening lock comprising:

a first slider having a projecting head, a first catch plate connected to said first slider, a hole defined by said projecting head, a second slider, a second catch plate connected to said second slider, a hole defined by said second catch plate adapted to receive the projecting head of said first slider, a cover body fixedly mounted on one side of said second catch plate, said cover body defining a hole corresponding to said hole defined by said second catch plate, a hook-shaped plate including a projection, said hook-shaped plate being slidably mounted in said cover body and said hook-shaped plate adapted to slide across said hole of said cover body and to slide perpendicular to the longitudinal axis of said hole of said cover body, a tip of said hook-shaped plate adapted to pass through said hole of said projecting head, and a sliding plate slidably mounted in said cover body, said sliding plate including a projection and said sliding plate adapted to slide in a direction parallel to the longitudinal axis of the cover body, said projection of said sliding plate engaging said projection of said hook-shaped plate to lock said first slider and said second slider together when said tip of said hook-shaped plate passes through said hole of said projecting head when the projecting head extends through the hole defined by said second catch plate and the hole defined by said cover body.

4,514,885

CLIP WITH TWO STABLE POSITIONS OF THE CLOTHES PIN TYPE

Régis Delahousse, Princé , and Philippe Delahousse, 33 Rte. de Nantes, both of Murs Erigné 49130, France

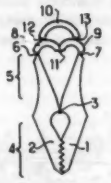
Filed Feb. 10, 1984, Ser. No. 579,191

Claims priority, application France, Feb. 14, 1983, 83 02540

Int. Cl.³ E05D *7/00;* **D06F** *55/02*

U.S. Cl. 24—557 **7 Claims**

1. A clip comprising first and second arm means pivotally connected to each other at a first hinge means located intermediate opposed ends of each arm means, a first component hingedly connected to an end of said first arm means, a second component hingedly connected to an end of said second arm means, wherein said first and second components are hingedly connected to each other and said ends are on the ssme side of said first hinge means, and spring means connected to said first component by a second hinge means and connected to said second component by a third hinge means, wherein said spring



means maintains said first and second arm means in two stable conditions and wherein said spring means is in tension only when said first and second arm means are between said two stable conditions.

4,514,886

UNIT FOR POSITIONING A VENETIAN BLIND LADDER AND FOR GUIDING THE SLATS OF THE BLIND THEREONTO

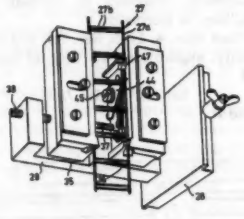
Gerardus H. Edixhoven, Voorschoten, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Jun. 21, 1983, Ser. No. 506,352

Claims priority, application United Kingdom, Jul. 23, 1982, 8221403

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—24.5 **12 Claims**



1. A unit for positioning a venetian blind ladder tape and for guiding slat material or individual slats for a blind between the individual rungs of a rung pair of the ladder tape, said unit comprising two body portions, a guiding member on each body portion, each guiding member locating, for movement longitudinally of the guiding member, one of the side tapes of the ladder tape and permitting the rungs to extend to the side tape located by the other guiding member, means resiliently urging said body portions apart from one another to tension the rungs, a slat guide element positioned to feed a slat or slat material between the rungs of a pair, an abutment located adjacent said slat guide element so as to be engaged by the rung of a pair nearer thereto, means to advance the ladder tape intermittently forward longitudinally of said guiding member and means to urge the ladder tape in a reverse direction between intermittent advances so that said nearer rung of a pair is engaged against said abutment and the rung pair is accurately positioned thereby relative to said slat guide element for insertion of a slat or slat material.

4,514,887

ROLL FOR USE IN CALENDARS OR THE LIKE

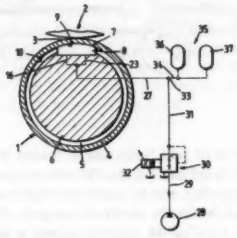
Richard Rauf, Krefeld-Oppum; Josef Pav, Krefeld, and Klaus Schöll, Krefeld-Fischeln, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Dec. 15, 1982, Ser. No. 450,110

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151001

Int. Cl.³ B21B *13/02*

U.S. Cl. 29—116 AD **11 Claims**



1. A pressure applying roll for use in calenders and the like, comprising a hollow rotary cylindrical shell having an internal surface; at least one bearing element provided in the interior of said shell and having an external surface provided with at least one recess and being adjacent to said internal surface; pressure generating means arranged to urge said bearing element toward said internal surface and having at least one chamber; flow restrictor means connecting said chamber with said recess; a source of pressurized liquid arranged to continuously supply liquid to said one chamber; an elastically yieldable pressurized liquid reservoir system communicating with said chamber, at least while such chamber is supplied with liquid by said source; first and second conduit means respectively connecting said one chamber with said source and with said reservoir system; and adjustable pressure regulating valve means in said first conduit means, the resistance of said first conduit means to the flow of liquid from said valve means to said one chamber being more pronounced than the resistance which is offered by said second conduit means to the flow of liquid between said reservoir system and said one chamber.

4,514,888

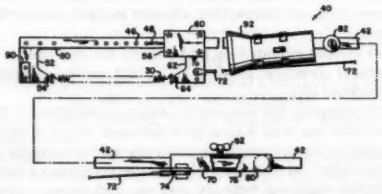
APPARATUS FOR INSTALLING A TENSION COIL SPRING

Louis B. Wheeler, Birmingham, Ala., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 31, 1983, Ser. No. 481,001

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—227 **6 Claims**



1. An apparatus for installing a tension coil spring comprising:

a. a longitudinally elongated support rod:

b. first spring engagement means mounted stationarily to said support rod at one end thereof, said first spring engagement means for engaging one end of the tension coil spring to be installed;

c. second spring engagement means supported from and translatably movable along said support rod, said second spring engagement means for engaging the other end of the tension coil spring to be installed so that the tension coil spring extends between said first and second spring engagement means; and

d. spring tensioning means operatively associated with said support rod for selectively positioning said second spring engagement means along said support rod so as to adjust the tension on the tension coil spring whereby the length of the tension coil spring is elongated as necessary for installation, said spring tensioning means comprising: handle support means supported from and translatably movable along said support rod, said handle support means having a handle extending therefrom at the end of said support rod opposite said first spring engagement means with said second spring engagement means disposed therebetween; and cable means extending from said handle support means to said second spring engagement means for attaching said handle support means to said second spring engagement means so that said second spring engagement means may be selectively positioned along said support rod by moving said handle support means along said support rod.

4,514,889

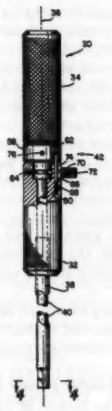
SPRING CLIP INSERTER TOOL

Stephen J. Ferlan, Wilkins Township, Allegheny Count, and Leonard T. Gesinski, North Huntingdon Twp., Westmoreland Co., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1983, Ser. No. 548,548

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—229 **5 Claims**



1. A tool for inserting a spring clip with inwardly turned ends into a hollow member, comprising:

coaxially disposed inner and outer members each having distal and proximal ends, the distal ends of said members being adapted to receive the spring clip thereon and engage the inwardly turned ends of the spring clip;

a front handle secured to the proximal end of said outer member;

a rear handle secured to the proximal end of said inner member;

means for innerconnecting said handles for relative rotational movement; and

means for releasably locking said handles against relative

rotational movement, wherein said handles are coaxially disposed, and wherein said means for releasably locking said handles comprises: a rotatable ring disposed between adjacent ends of said handles; means for selectively locking said ring against rotation relative to one of said handles; a pin slidably disposed in a longitudinal slot located in the adjacent end of the other handle, said pin being movable relative to a corresponding hole in said rotatable ring; an external thumb release secured to said pin; and a spring disposed in the longitudinal slot of said other handle for normally urging said pin into engagement with the hole in said ring.

4,514,890

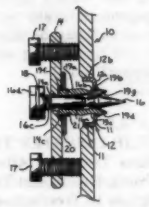
TOOL ASSEMBLY FOR REMOVAL AND INSTALLATION OF FREEZE PLUGS

Alvin E. Stewart, 2900 Hagemann, Kansas City, Kans. 66106

Filed Nov. 20, 1981, Ser. No. 323,282

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—256 **4 Claims**



3. A tool for pulling a freeze plug from an engine block comprising:

a shaft member terminating at one end in a tapered point for piercing a plug and forming an opening therein,

a frame supporting said shaft at a location on said shaft remote from said point,

means for moving said shaft longitudinally relative to said frame responsive to rotation of said shaft,

cooperating spreadable segments surrounding said shaft and associated with said point,

resilent means biasing said segments inwardly towards said shaft in a retracted condition during piercing of the plug,

said segments anchored at one end to said frame and free to move laterally outwardly relative to said shaft at the other end having plug engaging shoulders adapted to engage the plug around the opening and resist withdrawal of the segments through the opening when they have passed through the opening in the direction of piercing of the plug,

cooperating camming means on said shaft and said segments operable to spread said segments away from said shaft in response to longitudinal movement of said shaft relative to said frame, and

means for applying force to said frame thereby to displace same and cause the plug to be pulled from the opening by the engaged segments.

4,514,891

METHOD OF CONVERSION OF VEHICLE BODIES

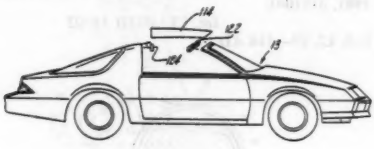
David L. Draper, Hamburg, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Division of Ser. No. 282,078, Jul. 10, 1981, Pat. No. 4,457,555. This application Jul. 11, 1983, Ser. No. 512,522

Int. Cl.³ B22D *19/10*; B23P *6/00*

U.S. Cl. 29—401.1 **3 Claims**

1. The method of converting a sedan passenger automobile body which includes a continuous roof panel, a floor pan and suspension supports formed integrally to each other, the steps comprising: adding a reinforcing structure having a channel member with inverted U-shaped cross-sections centrally and longitudinally within the interior of said body, fastening said channel member to said floor pan, adding a forward transverse reinforcing member within the interior of said body and fastening it to the channel member, to the floor pan and to the forward suspension supports, adding a rearward transverse member to the interior of said body and fastening it to the channel member, to the floor pan and to the rear suspension supports, cutting and removing the continuous roof panel completely from one side of said body to the other and along the sides of the continuous roof panel, and replacing a detachable roof panel in the cut away portion of the continuous roof panel.



4,514,892

MACHINE TOOL

Isao Tsujimura, Toyohashi, and Takani Yoshimi, Gamagori, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

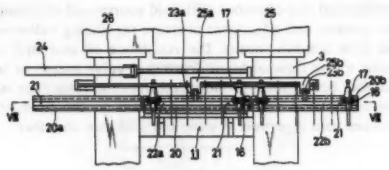
PCT No. PCT/JP81/00261, § 371 Date Jan. 6, 1982, § 102(e) Date Jan. 6, 1982, PCT Pub. No. WO82/02848, PCT Pub. Date Sep. 2, 1982

PCT Filed Oct. 1, 1981, Ser. No. 339,453

Claims priority, application Japan, Feb. 27, 1981, 56-26925

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **4 Claims**



1. A machine tool for machining a workpiece comprising:

a bed;

a workpiece support table slidably mounted on said bed for movement in a first horizontal direction;

a gate-shaped column having a pair of upstanding support portions fixedly mounted on said bed, said upstanding support portions being spaced in a second horizontal direction transverse to said first horizontal direction for permitting said workpiece support table to move thereacross;

a tool spindle mounted on said column for movements in a vertical direction as well as in said second horizontal direction; and

a tool magazine for removably storing a plurality of tools, wherein said tool magazine is disposed between said upstanding support portions and over said workpiece support table, and that said tool magazine comprises a support bracket disposed between and secured to said support portions of said column and formed with a guide way extending in said first horizontal direction, a frame mounted on said support bracket and slidable along said guide way, linear tool support means provided on said frame for removably holding a plurality of tools in such a manner that said tools form a row extending in said second

horizontal direction with the axes thereof extending in a vertical direction, and drive means connected to said frame for moving said tool support means between an advanced position where the row of said tools is presented under said tool spindle for a tool change operation and a retracted position where said row of said tools do not interfere with the machining of said workpiece,

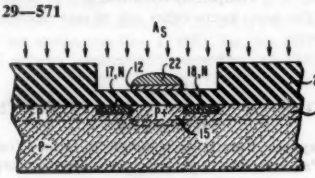
wherein said tool support means includes a supporting member secured to said frame, a slider slidably supported by said supporting member in said second horizontal direction, and a plurality of tool holders mounted on said slider each for releasably holding one of said tools, and wherein said tool magazine further comprises shifting drive means fixed to said column and connecting means provided between said shifting drive means and said slider for shifting said slider in said second horizontal direction when said shifting drive means is operated.

4,514,893

FABRICATION OF FETS

Eliezer Kinsbron, Highland Park; William T. Lynch, Summit, and Thomas E. Smith, Madison, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 29, 1983, Ser. No. 489,708
Int. Cl.³ H01L *21/265*
U.S. Cl. 29—571 **8 Claims**



1. A method of forming a field effect transistor which includes a source and drain region formed in the surface of a semiconductor substrate with a channel region therebetween, the method comprising the steps of:

forming a pattern of photoresist over the semiconductor substrate which leaves the desired channel region exposed and covers the remainder of the device area in the substrate;

implanting impurities into the exposed area of the substrate to form a surface region having a concentration which will set the threshold potential of the device to a desired level;

depositing at least one metal over the portion of the semiconductor exposed by the photoresist pattern to establish the boundaries of the gate electrode;

removing the photoresist pattern to expose the remainder of the device area; and

implanting source and drain regions into the substrate subsequent to the removal of the photoresist utilizing the gate electrode as a mask so as to align the edges of the source and drain regions with the surface region.

4,514,894

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE MANUFACTURING METHOD

Hiroto Kawagoe, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

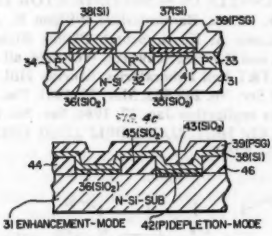
Continuation of Ser. No. 327,119, Dec. 3, 1981, abandoned, which is a division of Ser. No. 141,574, Apr. 18, 1980, Pat. No. 4,365,263, which is a continuation of Ser. No. 634,772, Nov. 24, 1975, abandoned. This application Jan. 3, 1984, Ser. No. 567,519
Claims priority, application Japan, Sep. 4, 1975, 50-107350
Int. Cl.³ H01L *21/265*
U.S. Cl. 29—571 **14 Claims**

1. A method of manufacturing a semiconductor integrated circuit device having a series gate matrix in which insulated field effect transistors are arranged in rows and columns and are serially connected in each row, comprising the steps of:

(a) forming an insulating layer on the surface of a semiconductor substrate of a first conductivity type, said insulating layer having a plurality of substantially parallel slots forming relatively thin insulating portions, and relatively thick insulating portions between adjacent slots, said slots extending along a row direction;

(b) selectively forming a masking layer on said thin and thick insulating portions to expose predetermined areas of said thin insulating portions;

(c) introducing an impurity of a second conductivity type, opposite to said first conductivity type, into surface portions of said substrate beneath said thin insulating portions through said exposed areas by using said thick insulating portions and masking layer as a mask to form a plurality of first semiconductor regions of said second conductivity type being self-aligned with said slots;



(d) selectively forming a plurality of gate electrode strips spaced from each other on the thin and thick portions of said insulating layer, along a column direction being substantially perpendicular to said slots, some of which said strips overlie said surface portions of said substrate; and

(e) introducing an impurity of said second conductivity type into selected regions of the surface of said substrate between adjacent ones of said strips by using said strips in said slot of each row and parts of said thick insulating portions not covered with said strips as a mask to form a plurality of second semiconductor regions of said second conductivity type, being self-aligned with said strips and slots, adjacent ones of said second semiconductor regions in each row respectively serving as a source and a drain for an insulated field effect transistor having said strip located therebetween as a gate, each of said first semiconductor regions serving as a conductive path between adjacent second semiconductor regions which interpose each such first semiconductor region therebetween.

4,514,895

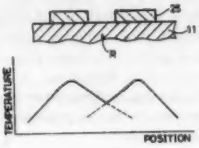
METHOD OF FORMING FIELD-EFFECT TRANSISTORS USING SELECTIVELY BEAM-CRYSTALLIZED POLYSILICON CHANNEL REGIONS

Tadashi Nishimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1984, Ser. No. 586,861
Claims priority, application Japan, Apr. 20, 1983, 58-71609
Int. Cl.³ H01L *21/265, 21/306, 21/268*
U.S. Cl. 29—571 **11 Claims**

1. A method of manufacturing MOS field effect transistor using a wafer having a polycrystal or amorphous semiconductor layer formed on an insulator, comprising the steps of: depositing a polysilicon layer on a silicon substrate; depositing on said polysilicon layer at least two non-reflective stripes forming a channel therebetween; scanning said polysilicon layer and said non-reflective stripes with an energy beam having a diameter and intensity adequate to melt said polysili-

con only in regions beneath and between non-reflective stripes and controlling said beam to be intermittent to impinge only



preselected regions of said polysilicon layer assigned to be channel regions.

4,514,896

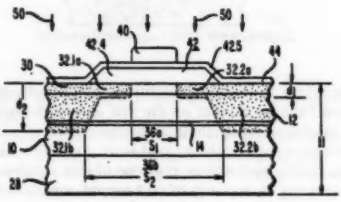
METHOD OF FORMING CURRENT CONFINEMENT CHANNELS IN SEMICONDUCTOR DEVICES

Richard W. Dixon, Bernardsville; William B. Joyce, Basking Ridge; Louis A. Koszi, Scotch Plains; Richard C. Miller, Summit, and Bertram Schwartz, Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 247,523, Mar. 25, 1981, Pat. No. 4,447,905. This application Jan. 17, 1984, Ser. No. 571,386

Int. Cl.³ H01L *21/265;* **B01J** *17/00;* **G01L** *29/06*

U.S. Cl. 29—576 B **3 Claims**



1. A method of forming a trapezoidal-shaped current channel in a semiconductor body comprising the steps of

(a) epitaxially growing a semiconductor layer on a major surface of said body,

(b) patterning said layer to form trapezoidal openings in said layer, the remaining segments of said layer forming complementary trapezoidal masks in cross-section, said masks having oblique side walls,

(c) subjecting said body to particle bombardment, the oblique side walls of the trapezoidal masks being effective to grade the penetration depth of the particles and to form high resistivity zones having oblique sides as a function of depth, and

(d) removing said masks from said surface.

4,514,897

ELECTRICALLY PROGRAMMABLE FLOATING GATE SEMICONDUCTOR MEMORY DEVICE

Te-Long Chiu, Houston, and Jih-Chang Lien, Sugar Land, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 470,122, Feb. 28, 1983, Pat. No. 4,467,453, which is a division of Ser. No. 72,504, Sep. 4, 1979, Pat. No. 4,376,947. This application Apr. 26, 1984, Ser. No. 604,270

Int. Cl.³ H01L *21/265, 29/76*

U.S. Cl. 29—578 **5 Claims**

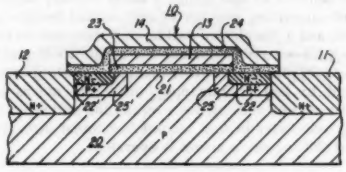
1. A method of making a semiconductor device comprising the steps of:

depositing a first conductive layer on a face of a semiconductor body of one type over an insulating coating, and patterning said first conductive layer to leave an electrode,

depositing a second conductive layer on said face over an insulating coating and over said first conductive layer, with insulating coating between the first and second layers, and patterning said second layer to leave an electrode,

introducing conductivity determining impurity of the opposite type into the body in self-alignment with the first and second conductive layers,

the improvement comprising the step of introducing con-



ductivity determining impurity of said one type into said body in self-alignment with the first conductive layer using one of said conductive layers as a mask, to form a region more heavily doped than the body, said region extending partially beneath the first conductive layer but not extending completely from one side of said electrode of the first layer to the other side of said electrode of the first layer.

4,514,898

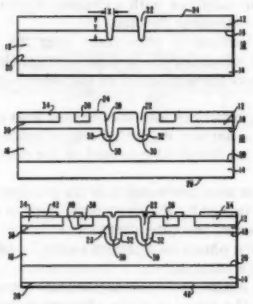
METHOD OF MAKING A SELF PROTECTED THYRISTOR

John X. Przybysz, Penn Hills, and John A. Ostop, Youngwood, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 18, 1983, Ser. No. 468,016

Int. Cl.³ H01L *21/223, 21/302, 29/74*

U.S. Cl. 29—582 **4 Claims**



1. A process for making a thyristor, said thyristor being self-protected from overvoltage by avalanche, comprising, forming two regions of a second type of semiconductivity in a body of semiconductor material of a first type of semiconductivity by diffusing a first doping material capable of forming a region of second type semiconductivity through opposed major surfaces of said body, said opposed major surfaces comprising top and bottom surfaces of said body, forming by laser etching a ring shaped groove in a central portion of said top surface of said body, said groove extending entirely through said region of second type semiconductivity, formed by diffusion through said top surface, and into said body of first type semiconductivity, diffusing a second doping material capable of forming a region of second type semiconductivity through said top and bottom surfaces of said body, said second doping material diffusing through said groove, whereby a region of

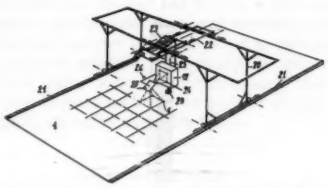
said second type of semiconductivity is formed adjacent to said groove in said body, said region extending into and becoming a part of said region of second type semiconductivity formed by diffusion through said top surface, forming at least two regions of said first type of semiconductivity in said region of second type semiconductivity formed by diffusion through said top surface, said at least two regions being spaced apart from each other and from said groove, said two regions extending into said region of second type semiconductivity to a width less than the width of the region of second type semiconductivity, affixing first metal electrical contacts to said top surface of said body of semiconductor material in ohmic electrical contact with said regions of first type semiconductivity and said region of second type semiconductivity whereby said regions are electrically shorted to each other, affixing a second metal electrical contact to said top surface in ohmic electrical contact with walls of said groove, and affixing a third electrical contact to the bottom surface of said body in ohmic electrical contact with said region of second type semiconductivity formed by diffusion through said bottom surface of said body.

4,514,899

APPARATUS WITH OPTICAL PROJECTOR FOR ASSEMBLING A WOODEN STRUCTURE

Raymond Burger, 7, place de la Fleur, Sainte-Marie-aux-Mines (Haut-Rhin), France

Division of Ser. No. 333,268, Dec. 22, 1981, Pat. No. 4,426,759. This application Dec. 1, 1983, Ser. No. 556,902
Claims priority, application France, Dec. 22, 1980, 80 27644
Int. Cl.³ B23Q *15/00*
U.S. Cl. 29—721 **9 Claims**



1. Apparatus for assembling a wooden structure from a plurality of wooden pieces, comprising a table on which said assembly is effected, an optical projector, means mounting the optical projector on the table for movement lengthwise of the table with the optical axis of the projector perpendicular to the table at the point of intersection with the table, and means to compress an assembly of wooden elements against said table with the wooden pieces arranged in a pattern dictated by the image projected by the projector onto the table.

4,514,900

APPARATUS TO MANUFACTURE HEAT EXCHANGER FINNED TUBE

Jacques A. V. Bénard, Paris, France, assignor to Con Rad Industries, Inc., Sand Springs, Okla.

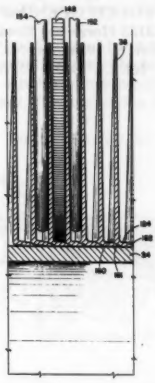
Filed Nov. 20, 1981, Ser. No. 323,539
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—727 **6 Claims**

1. An apparatus for producing heat exchanger finned tubing consisting of a central tube of heat conductive material and a spirally wound fin of a somewhat malleable heat conductive mterial, comprising:

first knurling means for forming a plurality of closely spaced substantially longitudinal grooves in the outer surface of the central tube and moving said tube longitudinally and rotationally;

forming means for bending one edge of the fin material into a substantially L-shaped cross-section forming a foot portion of the fin along said one edge;

roller means for tapering the thickness of the fin from a base adjacent the foot portion thereof to a thinner outer edge thereof thereby causing said fin or curl about the central tube with the foot portion being wrapped in spiraling engagement with the grooved outer surface of the central tube; and



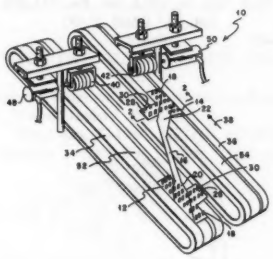
second knurling means for depressing and deforming the foot portion of the fin into close fitting meshing engagement with the substantially longitudinal grooves in the outer surface of the central tube, the heel portion of the foot portion disposed to slightly overlap a toe portion of the foot portion of the next succeeding wrap.

4,514,901

METHOD AND APPARATUS FOR ATTACHING MOUNTING PLATES

Edward R. Kirby, Dallas, Tex., assignor to Associated Truss Company, Dallas, Tex.

Filed May 23, 1983, Ser. No. 496,846
Int. Cl.³ B23P *19/00*; B30B *3/00*
U.S. Cl. 29—822 **4 Claims**



1. An apparatus for attaching a mounting plate having substantially parallel rows of prongs to a workpiece which forms rows of holes for receiving some of the prongs in an interference fit wherein the prongs extend substantially beyond the workpiece for further attachment to another object, comprising in combination:

a conveyor for carrying the mounting plate and the workpiece positioned above the mounting plate in a direction substantially parallel with the rows of prongs;

a roller positioned above the conveyor, having ribs which form circumferential grooves aligned to allow passage of the rows of prongs wherein the ribs extend sufficiently close to the conveyor to make contact with the workpiece and to force the rows of holes down over the prongs; and

means for turning the roller wherein the bottom of the ribs move in the direction of travel of the mounting plate and at substantially the same speed as the mounting plate.

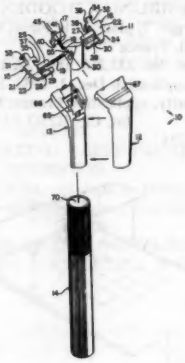
4,514,902
FOOD POUCH OPENING DEVICE
James F. Stewart, 13153 Horseshoe Bend Rd., Boise, Id. 83703
Filed Feb. 9, 1984, Ser. No. 578,446
Int. Cl.³ B65D *35/28*
U.S. Cl. 30—2 **8 Claims**

1. A food pouch opening device comprising:
a handle;
a pair of stripping rods affixed to said handle, and pivotaly moveable in relationship to one another from a closed to open position, said rods operable to clampingly engage a food pouch to tongs-like manner, and said rods having parallel abutting surfaces when in the closed position for stripping contents from a food pouch; and
cutting means affixed to at least one of said rods adjacent the terminal free end thereof, said cutting means operable to cut a food pouch for emptying the contents thereof.

4,514,903
PERSONAL GROOMING DEVICE
H. Maie' Pope, Boardwalk Apartment Bldg., 4343 N. Clarendon Ave., Chicago, Ill. 60613
Filed Nov. 14, 1983, Ser. No. 551,352
Int. Cl.³ B26B *21/00*
U.S. Cl. 30—49 **9 Claims**

1. A cutter for trimming and shaping facial hair, said cutter comprising:
a relatively narrow metal blade having a pair of longitudinally extending and opposed edges,
the first of said edges being honed or sharpened;
a fingergrip for said blade,
said fingergrip engaging said blade at said second edge thereof and over a portion of said strip towards said first edge,
said first or sharpened edge remaining exposed when said blade is engaged by said handgrip,
said handgrip having a central segment and a pair of longitudinally-extending wing segments integral therewith,
said wing segments being angled or inclined one toward the other,
said blade being thereby held in an angled or inclined attitude approximating that of said handgrip.

4,514,904
RAZOR HANDLE
Michael J. Bond, Quincy, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Sep. 21, 1983, Ser. No. 534,240
Int. Cl.³ B26B *21/52*
U.S. Cl. 30—87 **11 Claims**



1. A razor handle for a razor blade assembly adapted to be movably mounted on said handle, the razor blade assembly having a cam means thereon for receiving a biasing force and journal bearing means for coupling to said handle, said razor handle comprising:
journal means disposed on first and second movable members of said razor handle, said first and second movable members each including a hook member, said movable members being slidably movable toward and away from each other to permit engagement of the journal bearing means of the razor with said journal means of said razor handle when said movable members are in a first position away from each other, and disengagement of the journal bearing means of the razor blade assembly with said journal means of said handle when said movable members are in a second position toward each other; and
cam follower means having a free end portion, disposed between said first and second movable members and coupled to said razor handle for providing a yieldable biasing force on the cam means of the razor blade assembly, said cam follower means also including first and second catch means for releasably engaging said first and second hook members of said first and second movable members and for maintaining said movable members in said second position toward each other until said free end portion of said cam follower means receives a predetermined force from the razor blade assembly thereby releasing said movable members to said first position for engagement with the razor blade assembly.

4,514,905

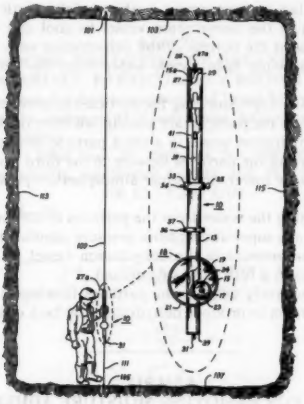
CONVERGENCE EXTENSOMETER FOR MEASURING MINE ROOF SUBSIDENCE

William W. Lutzens, Parachute, Colo., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 26, 1983, Ser. No. 535,428

Int. Cl.³ G01B 5/30; G08B 21/00

U.S. Cl. 33—125 B **11 Claims**



1. An extensometer for measuring changes in the vertical distance between the roof and floor of a mine opening which comprises a pair of rigid telescoping members, a tension spring securing said member to each other in a telescoping relationship, means for attaching a non-extendible cable to each of said members, and an indicator for determining telescopic movement of said members comprising a pair of lugs, each of said lugs being affixed to a separate flange.

4,514,906

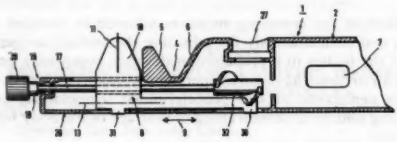
PUPILLARY DISTANCE MEASURING INSTRUMENT

Paul Pehart, Kapuzinerstrasse 35, D-8000, Munchen 5, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,081

Int. Cl.³ A61B 3/10

U.S. Cl. 33—200 **6 Claims**



1. An instrument for measuring the distance of the eye from the root of the nose comprising a housing having a handle portion adapted for gripping by the hand of a user, said handle portion further having recesses therein for receiving a battery and a battery-operated display device, said housing further having a nose piece portion for resting on the root of the nose, said housing further having a measurement portion with interior recesses and at least one slot through said housing in said measurement portion; a slider in said housing measurement portion, said slider having a transparent plate projecting therefrom and through said slot, said plate having an eye index mark thereon; a rotatable shaft projecting from the measurement portion of the housing at one of its ends, and into the interior recesses of said measurement portion at its other end; means for drivingly coupling said shaft interior end to said slider, whereby rotation of said shaft causes said slider plate to linearly move relative to said nose piece.

4,514,907

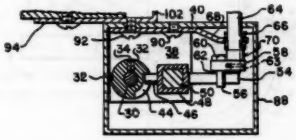
BOW AND ARROW SIGHTING DEVICE

Leonard F. Saltzman, 14 Sandybrook Rd., Burlington, Mass. 01803

Division of Ser. No. 357,726, Mar. 12, 1982, which is a continuation-in-part of Ser. No. 265,361, May 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 63,464, Aug. 3, 1979, abandoned. This application Jul. 18, 1984, Ser. No. 631,874

Int. Cl.³ F41G 1/46

U.S. Cl. 33—265 **18 Claims**



1. In a sighting device for a bow and arrow the combination of

a. a range finder of the type having a rotatable target range adjustment wheel member with a range adjustment angular displacement corresponding to distance to the target,

b. a bow sighting member mounted for movement in a vertical plane when the sighting device is fixed to the bow and the bow and arrow are aimed at the target, and

c. cam means coupled to responsive relation to said rotatable target range adjustment wheel member and in control relation to said bow sighting member for causing said bow sighting member to be moved in said vertical plane in response to rotation of said target range adjustment wheel member to a sighting position with respect to said bow such that said arrow is inclined with respect to the target by an amount corresponding to the displacement of said target range adjustment wheel member for the associated distance to the target.

4,514,908

LEVEL WITH TWO GUIDE FRAMES AND BALL IN EACH

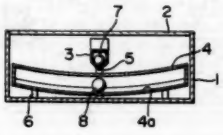
Izumi Yamaguchi, Ohmiya, Japan, assignor to Kabushiki Kaisha Nagaoka, Tokyo, Japan

Filed Aug. 6, 1984, Ser. No. 637,865

Claims priority, application Japan, Apr. 13, 1984, 59-54519[U]

Int. Cl.³ G01C 9/10

U.S. Cl. 33—365 **2 Claims**



1. A level characterized by comprising:

a base member;

two guide frames arranged within said base member one above the other so that they cross each other at right angles, and which are each provided with an internal rolling-contact surface shaped as an upward-curving circular arc, the lowest parts of said rolling-contact surfaces

being positioned at the point at which said guide frames cross, and the interiors thereof being visible through top surfaces thereof; and

a ball contained rotatably in each of said two guide frames.

4,514,909

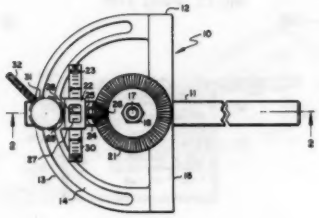
MITER GAUGE

Curtis R. Gilbert, 501 W. Gilbert, Viroqua, Wis. 54665

Filed Aug. 8, 1983, Ser. No. 520,998

Int. Cl.³ B26D 7/06; B43L 7/06

U.S. Cl. 33—471 **20 Claims**



1. A miter gauge for establishing a miter angle between a workpiece and a tool, said miter gauge comprising

a. a guide bar adapted to slide within a groove, in a direction parallel to the bar's longitudinal axis;

b. a reference frame pivotably mounted on the guide bar and adapted to support the workpiece as it is pushed across the tool;

c. a rotatably mounted angle index dial graduated to show the miter angle at which the gauge is set; and

d. gear means for turning the angle index dial as the reference frame is pivoted on its mount to the guide bar, said gear means being further operative to rotate the angle index dial through a greater angle than the change in the miter angle, whereby the resolution in setting the miter angle is increased substantially.

4,514,910

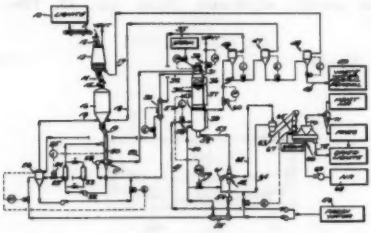
DEHYDRATION OF LIGNITE OR THE LIKE

Carl L. Elmore, and Erwin D. Funk, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,675

Int. Cl.³ F26B 3/00

U.S. Cl. 34—15 **17 Claims**



1. A method of dehydrating low rank coal comprising the steps of continuously:

(a) establishing a first flow stream of particulate low rank coal;

(b) preheating the first flow stream of particles with steam;

(c) immersing the first flow stream of particles in water;

(d) transferring the particles flowing in the first flow stream immersed in water to a second flow stream having a pressure substantially higher than in said first flow stream, and in the range of about 300–1500 psig;

(e) feeding the particles in the second flow stream to the top of a dehyration vessel, and separating the liquid from the particles at the dehydration vessel and recirculating the separated water to the second flow stream;

(f) exposing particles at the top of the dehydration vessel to saturated steam, condensing steam and particles flowing downwardly in a column in the dehydration vessel;

(g) effecting countercurrent washing of the particles at the bottom of the dehydration vessel to cool and wash the particles at the bottom of the dehydration vessel;

(h) withdrawing spent wash water from the dehydration vessel;

(i) gradually depressurizing the particles to prevent breakup thereof, as the particles are withdrawn from the bottom of the dehydration vessel in a third particle flow stream by transferring the particles flowing in the third flow stream to a fourth, lower—but super-atmospheric—pressure flow stream;

(j) separating the water from the particles in the fourth flow stream at a super-atmospheric pressure significantly lower than the pressure in the dehydration vessel, to flow the particles in a fifth flow stream; and

(k) evaporatively cooling the particles flowing in the fifth flow stream to produce dehydrated low rank coal in a dry form.

4,514,911

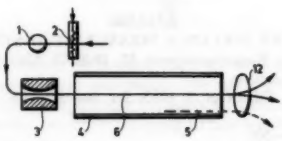
METHOD FOR REMOVING MOISTURE ADHERED TO SURFACES OF BODIES AND FOR SIMULTANEOUSLY ADJUSTING THE SURFACE TEMPERATURE OF THE BODIES

László Varga; Sándor Krekács; János Latorcai; Zoltán Pálfi, all of Budapest, and István Fledrich, Gödöllö, all of Hungary, assignors to Budapesti Muszaki Egyetem, Budapest, Hungary

Filed Jul. 13, 1982, Ser. No. 397,876

Int. Cl.³ F26B 3/04

U.S. Cl. 34—22 **1 Claim**



1. Method for removing moisture adhered to surfaces of bodies and simultaneously for adjusting the surface temperature of the bodies to a predetermined value, comprising providing air or steam having a temperature within a range of ± 10 degrees centigrade of said predetermined temperature, and streaming said air or stream along the surface of the body with a velocity

$$\bar{v}_l = c\sqrt{\frac{g \cdot t_v}{G_l} \cdot v_{vl} \cdot (R_b - R_l)^{-1}} \cdot \frac{1}{1 - f_l},$$

wherein

$\bar{v}_l$ is the average velocity of stream of the air or steam,

g is the gravitational acceleration ($g = 9.81\ m/s^2$),

t_v is the dynamic viscosity of the moisture in the state of its removal,

G_l is the specific weight of the air or steam in the state of removal of the moisture,

v_{vl} is the velocity of stream of the moisture at radius R_l,

R_b is the hydraulic radius of the moistured surface,

R_l is the hydraulic radius of the interface of the moisture and the air or steam,

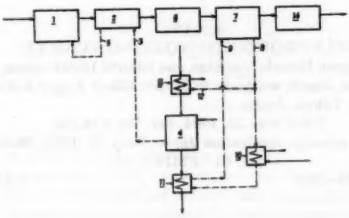
f_l is the degree of saturation of the air or steam,

c is

$$c = \sqrt{\frac{8}{k}},$$

wherein
$0.0015 < K < 3$ and k is the modified resistance coefficient.

4,514,912
PROCESS FOR DRYING OF ORGANIC SOLID MATERIALS, PARTICULARLY BROWN COALS
Alois Janusch, Leoben-Seegraben, and Franz Mayer, Graz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria
Filed Nov. 14, 1980, Ser. No. 206,896
Claims priority, application Austria, Jan. 21, 1980, 312/80
Int. Cl.³ F26B *3/06*
U.S. Cl. 34—37 **15 Claims**



1. Process for drying organic solid materials, particularly brown coals, in which the preheated solid materials are passed through at least one drying stage and put there under the action of saturated steam under a super-atmospheric pressure, characterized in that the solid materials are, after removal of the process water formed, at least partially pressure-released and further dried in an atmosphere of super-heated steam at a temperature of the steam atmosphere of at least 200° C. and in that the steam from the steam atmosphere is passed along a closed circuit over heat exchangers and brought to and/or maintained at the temperature of the steam atmosphere, the excess steam of the steam obtained and to be supplied to the heat exchanger or exchangers being tapped from the steam obtained and being used for preheating purposes.

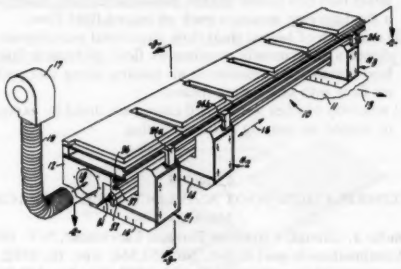
4,514,913
APPARATUS FOR DRYING A MOVING WEB HAVING MOVABLE DRYER MODULES
Erik W. Stephansen, Hillsborough, Calif., assignor to Impact Systems, Inc., San Jose, Calif.
Filed Feb. 7, 1984, Ser. No. 577,898
Int. Cl.³ F26B *23/04*
U.S. Cl. 34—48 **8 Claims**

1. Apparatus for drying a moving web having a variable cross-direction moisture profile comprising:

an elongated structural member having a length at least as great as said web in a transverse cross-direction and carrying a plurality of movable dryer modules for drying said web, said modules having an effecting heating area mounted in close proximity to said web and for movement in said cross-direction, the combined lengths of said heating areas measured in the cross-direction being substantially less than said length of said web measured in the cross-direction;

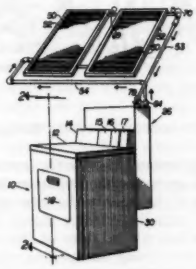
means for deriving said moisture profile of said web and means for compiling a list of deviations from a predetermined moisture target at a plurality of locations across said web;

automatic means responsive to said moisture profile to move each dryer module to an optimum cross-direction location



where the worst deviations of said list from said predetermined moisture target occurs.

4,514,914
SOLAR CLOTHES DRYER
George R. Kitzmiller, 721 E. 5th St., Hialeah, Fla. 33010
Filed Feb. 16, 1984, Ser. No. 580,817
Int. Cl.³ F24J *3/02*; F24B *19/00*
U.S. Cl. 34—93 **14 Claims**



1. A solar drying assembly of the type primarily designed to dry clothes and like articles by exposure to heated air, said drying assembly comprising:

(a) a dryer housing including a casing having a hollow interior dimensioned and structured to maintain clothes therein, air inlet means formed in said casing and disposed in communicating relation to a supply of heated air,

(b) an air flow casing structured to at least partially define a path of air flow disposed in direct fluid communicating relation with said casing hollow interior,

(c) an air flow casing entrance means disposed within said path of air flow and comprising a cover means for defining an exterior face of said air flow casing, said cover means including an apertured construction and being disposed and dimensioned to allow a quantity of air flow to pass therethrough,

(d) air heater means including a heat transferring coil means mounted in said air flow casing downstream of said cover means and structured to house a substantially continuous flow of heated fluid therein, said heat transferring coil means disposed in heat transferring, substantially interruptive relation to air passing along said path of air flow,

(e) air driving means disposed in fluid communication with said air flow casing and at least partially defining said path of air flow through said casing and said air flow casing entrance means,

(f) solar energy collector means disposed in direct exposure to radiant energy from the sun and including heat absorb-

ing coil means structured to house a substantially continuous flow of heated fluid therein,

(g) said heat absorbing coil means disposed in direct fluid communication with said transferring coil means, the latter two coil means at least partially defining along with a fluid driving means, a path of heated fluid flow,

(h) said path of heated fluid flow structured and disposed to direct a substantially continuous flow of heated fluid in heat transferring relation to air passing along said path of air flow into said casing means,

(i) whereby clothes within said casing are dried by exposure to heated air passing into said casing.

4,514,915

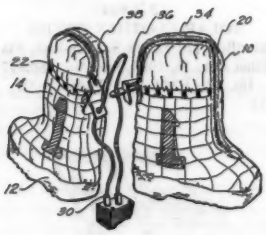
COMBINATION BOOT AND LOCKABLE STORAGE MEANS

Nicholas J. Galetta, 1 Blossom Terrace, Larchmont, N.Y. 10538

Continuation-in-part of Ser. No. 353,566, Apr. 16, 1982, abandoned. This application Dec. 6, 1982, Ser. No. 447,207

Int. Cl.³ A43B *3/16*

U.S. Cl. 36—1 **3 Claims**



1. A combination boot and lockable storage means comprising:

a boot having an opening therein for insertion of a foot into the boot, said opening extending from the rear of the boot along the top of the boot to the front of the boot;

a slide fastener including closure means having a pendant member, attached to the sides of the opening along its entire length for closing the opening around an ankle of a foot when inserted therein and completely closing the opening when the foot is removed therefrom;

a slide extension member having one end attached to the top rear area of the boot;

a first opening provided in the other end of said pendant member adapted for passage therethrough of the slide extension member for securing the members together when the closure means completely closes the opening, the extension member having an opening therethrough at its other end adapted to received cable means to maintain the pendant means in a locked position and provide means to suspend the boot from and lock the boot to, a secure location.

4,514,916

SOLE FOR CROSS-COUNTRY SKI SHOE

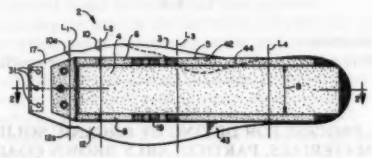
Kjell Aarflot, Oslo, Norway, assignor to Nike, Inc., Beaverton, Oreg.

Filed Jun. 8, 1982, Ser. No. 386,352

Int. Cl.³ A43B *5/04*; **A63C** *9/00*

U.S. Cl. 36—117 **9 Claims**

1. An outer sole for a cross-country ski shoe wherein the shoe moves upward and downward with respect to the ski during skiing, said sole comprising a flexible sole plate member having a toe section, a forefoot section, an arch section, a heel section, an upper surface for attachment to a shoe upper and a lower surface adapted to contact a ski, said lower surface having a pair of transversely spaced, longitudinally extending side walls defining between them a longitudinally extending groove, said groove having a width sufficient for receiving the ski so that said side walls of said groove extend about the side walls of the ski, said groove extending through at least said



forefoot, arch and heel sections so that in normal cross-country skiing motions some portion of said side walls of said groove extend about the side walls of the ski to provide lateral stability.

4,514,917

SELF-PROPELLED WORKING VEHICLE

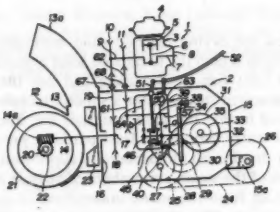
Takeo Ogano; Hiroshi Sueshige, and Sakichi Hatakeyama, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,204

Claims priority, application Japan, May 25, 1983, 58-93197

Int. Cl.³ E01H *5/09*

U.S. Cl. 37—249 **5 Claims**



1. A self-propelled working vehicle comprising:

a vehicle frame;

an engine mounted on said vehicle frame;

working implement means equipped to said vehicle frame and operatively interconnected to be driven with said engine;

running means suspended from said vehicle body;

said running means having at least one driving wheel mounted on an axle;

first transmission means disposed in said vehicle frame;

said first transmission means having a drive shaft extending in the fore to aft direction of said vehicle, a drive disc secured at the center thereof to the rear end of said drive shaft, a driven shaft arranged behind said drive disc perpendicularly to said drive shaft and operatively connected to said axle of said driving wheel, and a friction disc fitted on and arranged to be slidable along and non-rotatable about said driven shaft and adapted along the circumference thereof to be frictionally engageable with said drive disc;

second transmission means disposed in said vehicle frame; and

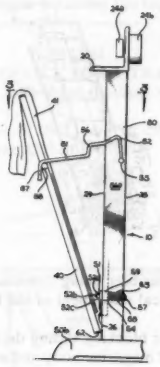
said second transmission means being operatively connected to said engine and supporting at least the front end of said drive shaft, such that the driving power from said engine is transmittable to said drive shaft in the form of a torque, shiftably between at least a pair of speed modes.

4,514,918

PANTS PRESSER WITH SPRING GRIPPING DEVICE

David Warner, 999 Green St., #1905, San Francisco, Calif. 94133

Filed Sep. 1, 1983, Ser. No. 528,577
Int. Cl.³ D06F 71/28
U.S. Cl. 38—36 10 Claims



1. A pants presser comprising:

first and second flat members having facing surfaces between which pants are pressed, said second member being maintained in a a substantially vertical plane by a pair of support brackets, one of which is disposed along each vertical side edge of said second member, and said first member being angularly movable with respect to said second member;

a heatable sheet covering at least one of said members;

a pants gripping means attached near the bottom of said second flat member, said gripping means being mounted so that it moves substantially linearly and transversely to the plane of said second flat member when said first member is closed against said second flat member; and,

a latching means connecting said first flat member to said second flat member for urging said first flat member towards said second flat member and maintaining said first flat member at predetermined angles with respect to said second flat member,

said latching means comprising a knob disposed upon the side edge of said first flat member, and a latch bar pivotally connected to one of said support brackets on the same side of said presser as said knob, said latch bar comprising at least three detents, wherein

the first detent is disposed furthest from the pivoted connection to said support brackets at a position whereby when said knob is seated in said first detent, said gripping means is not in contact with said first flat member so that the pants can be installed in said pants presser without obstruction;

the second detent is disposed at an intermediate distance from said pivoted connection, whereby when said knob is seated in said second detent, said first and second flat members are angularly disposed with respect to each other such that said gripping means is urged against and proximate with said first flat member, thereby gripping the bottom of pants installed thereon such that said pants bottoms are securely held in place while the remainder of the pants are free; and,

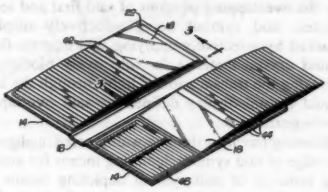
the third detent is disposed closest to said pivoted connection, whereby when said knob is seated in said third detent, said flat members are held in vertical adjacent relation with each other such that said pants installed thereon are pressed therebetween.

4,514,919

APPARATUS FOR STORING, DISPLAYING AND IDENTIFYING PHOTOGRAPHS

Sheldon Plutsky, Chatsworth, Calif., assignor to Pioneer Photo Albums, Inc., Chatsworth, Calif.

Filed Oct. 17, 1983, Ser. No. 542,404
Int. Cl.³ A47G 1/06
U.S. Cl. 40—159 3 Claims



1. A flippable pocket for a photo album having a backing member to which the pocket is attachable at a first edge thereof comprising:

a transparent member having a fold along its center, said fold forming said first edge and dividing said member into two transparent panels, each having an edge opposite the fold;

an opaque sheet placed between said transparent panels with a first edge against the fold and a second edge extending slightly beyond the edges of the transparent panels opposite the fold; and

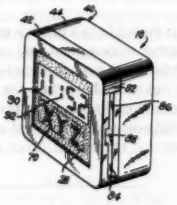
an adhesive-backed opaque strip having a surface for writing upon and a width slightly greater than twice the distance that said opaque sheet extends beyond the edges of the transparent panels opposite the fold, said strip centered on said second edge and folded over upon and adhering to said opaque sheet and said transparent panels adjacent their edges opposite the fold, whereby a pocket having two compartments for holding photographs and opaque writing surfaces which do not substantially block photographs placed within the compartments is formed.

4,514,920

DISPLAY MODULE

Doron Shafrir, 4 Ross Ave., Spring Valley, N.Y. 10977, and Giora Tamir, 26 Lillian St., Pamona, N.Y. 10970

Filed Nov. 16, 1982, Ser. No. 442,139
Int. Cl.³ G09F 9/00
U.S. Cl. 40—448 14 Claims



1. A display module for displaying a symbol, said display module comprising:

a liquid crystal display including first and second glass plates, a liquid crystal material between said glass plates, first and second polarizers adjacent said first and second glass plates, respectively, and first and scond transparent electrodes on the inner surfaces of said first and second glass plates, respectively;

a source of electricity, and a circuit connected to said source

of electricity and said electrodes for applying an electric field across said liquid crystal material;

a housing for supporting said liquid crystal display, said source of electricity, and said circuit in assembled relation;

symbol depicting means having a symbol for display to a viewer; and

a supporting structure receivable in said housing for supporting said symbol depicting means behind said liquid crystal display with the symbol within the projected area defined by the overlapping portions of said first and second electrodes, said symbol being selectively displayed and masked by selectively applying said electric field to said liquid crystal material for selectively blocking and unblocking the transmission of light through the area of said liquid crystal display defined by said overlapping electrode portions;

said housing having a slot in a wall thereof in alignment with an edge of said symbol depicting means for accommodating removal of said symbol depicting means from said housing for permitting replacement of said symbol depicting means with a different symbol depicting means having a different symbol.

4,514,921

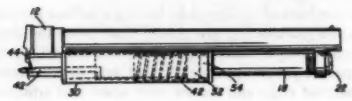
FIREARM RECOIL BUFFER

Frank M. Burkleca, 5947 Library Rd., Bethel Park, Pa. 15102

Filed Feb. 7, 1983, Ser. No. 464,642

Int. Cl.³ F41C *27/00, 21/18*

U.S. Cl. 42—1 V **15 Claims**



1. A firearm recoil reducing device comprising,

a firearm having a receiver,

a fore end member positioned forwardly of said receiver,

means for connecting said fore end member to said receiver,

a movable fore end adapted to receive said fore end member,

said movable fore end having an internal shoulder,

a compression coil spring positioned in said movable fore end in surrounding relation with said fore end member,

said coil spring having a first end and a second end,

said coil spring first end exerting a force on said fore end internal shoulder,

a spanner nut releasably engageable with the end of said fore end member adjacent said coil spring second end portion, and

said spanner nut movable to a predetermined position on said fore end member to compress said coil spring on said fore end member between said fore end internal shoulder and said spanner nut such that when the firearm is discharged said movable fore end remains stationary against the compression of said coil spring and said coil spring compresses further to reduce the recoil force directed toward said receiver.

4,514,922

GUN MAGAZINE STRUCTURE

Frank W. Farrar, Los Alamitos, and Carl J. Cupp, Hawaiian Gardens, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed Feb. 1, 1983, Ser. No. 462,958

Int. Cl.³ F41C *25/02*

U.S. Cl. 42—50 **11 Claims**

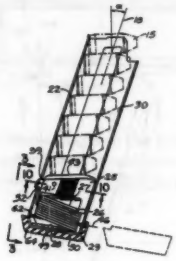
1. A magazine comprising:

a magazine body to be removably inserted into a gun and adapted to contain a series of rounds of ammunition;

a spring yieldingly urging said rounds upwardly for firing by the gun;

a floor plate disposed across the bottom of said body;

a sliding connection mounting said floor plate to said body for generally horizontal sliding movement relative thereto to attach the floor plate to or remove it from said body;



said sliding connection being constructed to allow slight generally vertical movement of the floor plate relative to said body; and

locking means for blocking sliding detachment of said floor plate from said magazine body and adapted to be released to permit such sliding detachment by said slight generally vertical movement of the floor plate relative to the magazine body.

4,514,923

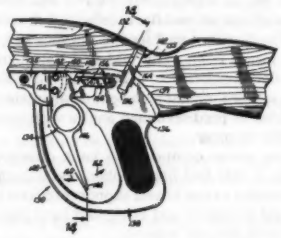
TRIGGER ACTUATOR

Patrick Teel, 5215 11th Ave., Minneapolis, Minn. 55417

Continuation-in-part of Ser. No. 413,859, Sep. 1, 1982, abandoned. This application May 31, 1984, Ser. No. 615,929

Int. Cl.³ F41C *19/00*

U.S. Cl. 42—69 R **3 Claims**



1. A trigger-actuating device for use in a firearm having a trigger, with the trigger being movable between a normal non-fire position and a fire position, the device comprising:

an actuator lever pivotally attachable to the firearm at one end and having a second, free end for manual engagement and the lever having first and second side members extending along both sides of the trigger to a position forward of the trigger;

means for pivotally attaching the actuating lever to the firearm including a trigger guard assembly having a pistol grip portion and a forward guard portion and means for fixedly attaching the pistol grip portion to the firearm and first and second slots disposed within the pistol grip portion and first and second slot followers in sliding relationship with the slots and each slot follower having a pin portion extending therefrom pivotally engaging the actuating lever;

a first pin member extending between the side members at a position forward of an upper section of the trigger;

a second pin member extending between the side members forward of a lower portion of the trigger; and

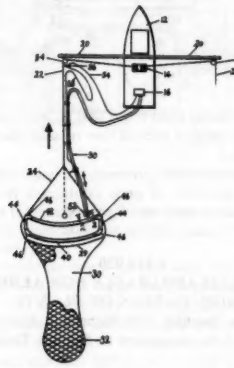
wherein the first and second pin members are positioned such that when the free end of the lever is moved in a first direction, the first pin member engages the upper portion of the trigger actuating the trigger, and when the free end of the actuating lever is moved in an opposing second direction, the second pin member engages a lower end portion of the trigger actuating the trigger.

4,514,924

OPENING DEVICE FOR A TRAWL NET

Maurice J. Ojserkis, A-14 Point Gardens Apartments, Somers Point, N.J. 08244

Filed Jul. 9, 1982, Ser. No. 396,783
Int. Cl.³ A01N *93/02*
U.S. Cl. 43—9 **1 Claim**



1. An improved method of fishing using a conventional type fishing net to be trawled but without the use of trawling doors and requiring substantially less use of energy than is normally required with a conventional net having trawling doors and a mouth opening comprising the steps of attaching a normally flaccid flexible hose structure around said mouth opening of the net;

suspending the net from a fishing vessel so as to be capable of applying hydraulic fluid under high pressure to the normally flaccid flexible hose structure in order to make same rigid for holding the mouth of the fishing net open;

performing trawling operations in a conventional manner; and releasing the hydraulic pressure from the flexible structure in order to collapse same together with the mouth opening in order to close said fishing net prior to hauling the net aboard the vessel.

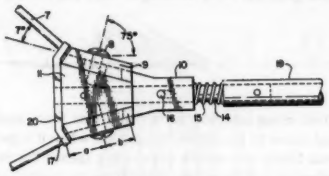
4,514,925

FOLDING NET MECHANISM

Albert M. Rockwood, 505 Ruddiman Dr., N. Muskegon, Mich. 49445

Filed Feb. 28, 1983, Ser. No. 458,667
Int. Cl.³ A01K *77/00*
U.S. Cl. 43—12 **4 Claims**

1. A folding fishing net comprising a handle; a support block attached to said handle; two arms pivotally attached to said support block so as to rotate at an angle to the handle; a net attached to both arms and supported on a third side by a flexible interconnecting member; pivoting arm supports into which the arms are recessed, said pivoting arm supports having a truncated conical form about the outer periphery thereof, said pivoting arm supports each carrying a latching notch at one end of the conical form; a single latch element slidably mounted to the handle having protrusions in line with the axis of the handle designed to engage the latching notches; the latch being spring loaded so that its protrusions are in continuous contact with the conical form of the arm supports until they can engage both notches when both arms are fully extended.

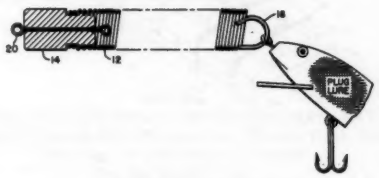


4,514,926

SNAGGED FISH HOOK RELEASE DEVICE

Richard E. Weber, Sr., 3719 Sarah St., Franklin, Ohio 45005

Continuation-in-part of Ser. No. 183,434, Sep. 2, 1980, abandoned, Continuation of Ser. No. 419,730, Sep. 20, 1982, abandoned. This application Jan. 30, 1984, Ser. No. 575,282
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—17.2 **7 Claims**



1. In a snagged fish hook release device for disposing between a hook and a line on fishing tackle, the improvement in combination therewith which consists of only two parts specifically comprising:

(a) an elongated helically wound tension spring having a first end with means thereon for detachably joining directly to the eye at the end of the shank on said fish hook, and having an open second end; and,

(b) an elongated weight having a first end externally threaded for threadably engaging the open end of said spring, and with an unthreaded extending second end having means thereon for the attachment of said line, the inward end of the thread on the first end of said weight directly adjacent to the extending second end of said weight having a reduced diameter undercut with respect to the minor diameter of said first threaded end for receiving at least the first coil on the open end of said spring when assembled on said weight for resisting separation of said weight from said spring when said spring is rotated.

4,514,927

FISHING LINE WITH A REINFORCED LEADER

Hiromu Fukemoto, 953-9, Kushimoto, Kushimoto-cho, Nishimuro-gun, Wakayama, Japan

Filed Nov. 25, 1983, Ser. No. 555,631
Claims priority, application Japan, Nov. 27, 1982, 57-208336
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—44.98 **2 Claims**

1. A fishing line assembly having a fishing line, a hook, a leader connected between said fishing line and said hook, a reinforcing rod for reinforcing said leader when a big fish has taken the hook, a ring member for connecting said fishing line to said leader, said fishing line having one end passing through

said ring member and attached to one end of said reinforcing rod remote from said hook, a stopper means attached to said fishing line for stopping temporarily said reinforcing rod in its inoperative position from moving toward the hooks, said reinforcing rod being adapted to become free from said stopper means and move to its operative position when it is pulled with a sufficient force, and return preventing means for preventing said reinforcing rod from returning from its operative position along said leader to its inoperative position.

4,514,928

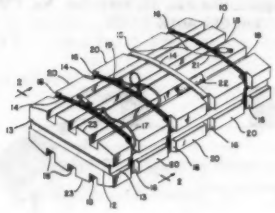
LEADER HOLDER WITH ELASTIC ELEMENT

Clarence A. Hanson, Hilman, Minn., assignor to Richard A. Hanson, Woodinville, Wash.

Filed Jan. 27, 1983, Ser. No. 461,660

Int. Cl.³ A01K *97/06*

U.S. Cl. 43—57.2 **11 Claims**



1. A leader storage device comprising:

a base;

at least one pair of opposite winding slots located on opposite sides of said base, wherein said base includes a pair of posts located on opposite sides of each said winding slot, wherein each said winding slot has a bottom, and wherein said winding slots are adapted to have wound therein and therebetween leader means;

at least one winding plan surface extending between said at least one pair of winding slots; and

an elastic tension band, wherein said elastic tension band is supported by each said pair of posts, wherein said elastic tension band extends across said winding slots and is spaced away from said bottoms of said winding slots to permit said elastic tension band to be deflected downwardly under tension into said winding slots by said leader means, when said leader means is wound under tension over said elastic tension band, to permit said elastic tension band to exert a winding and holding tension on said leader means to keep said wound leader taut.

4,514,929

CELL

Jacobus W. Lestraden, Sassenheim, Netherlands, assignor to Schulte & Lestraden B.V., Sassenheim, Netherlands

Filed Jun. 6, 1983, Ser. No. 501,188

Claims priority, application Netherlands, Jun. 10, 1982, 8202342

Int. Cl.³ A01G *13/00*

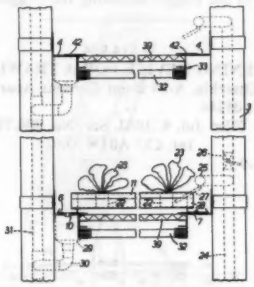
U.S. Cl. 47—17 **18 Claims**

1. A cell for growing plants, said cell comprising:

(a) at least one stand in which a plurality of crop containers are arranged in a plurality of layers one above the other;

(b) at least one light source located beneath a first one of said plurality of crop containers and above a second one of said plurality of crop containers; and

(c) a plate made from a heat insulating material disposed between said at least one light source and said first one of said plurality of crop containers, the side of said plate facing said at least one light source being light reflecting, whereby:



(d) said plate reflects light from said at least one light souce downwardly on said second one of said plurality of crop containers and

(e) said plate substantially prevents the underside of said first one of said plurality of crop containers from absorbing heat from said at least one light source.

4,514,930

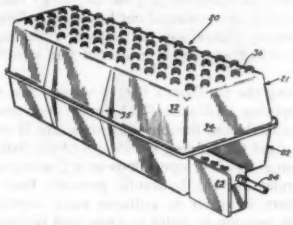
METHOD AND APPARATUS FOR AEROPONIC PROPAGATION OF PLANTS

Steven M. Schorr, Boulder, and Richard J. Stoner, Jr., Longmont, both of Colo., assignors to Genisis Technology, Inc., Boulder, Colo.

Filed Jan. 6, 1983, Ser. No. 455,989

Int. Cl.³ A01G *31/00*

U.S. Cl. 47—60 **5 Claims**



1. An apparatus for applying an intermittent aqueous atomized mist composition to plants, including an enclosed chamber, means for supporting plant cuttings with a propagation portion thereof extending into said chamber, and means for intermittently applying an aqueous nutrient mist composition to said plants, comprising a supply of water at tap water pressure, means for controlling the flow of water from said supply, a distributing manifold including a plurality of mist forming nozzles positioned in said chamber, a source of plant growth promoting composition, a suction venturi positioned above and in communication with said growth promoting composition for introducing said plant growth promoting composition into said water from said supply before said water is introduced into said distributing manifold, means for draining water from said distributing manifold and venturi unit, and means for actuating said water control means and said drain means in an intermittent timed sequence for periodically stopping flow of said water, draining said suction venturi and distributing manifold;

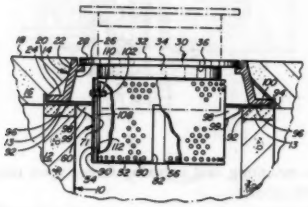
and thereafter initiating flow of said water from said supply and a flow of said growth composition from said source through said venturi to form an aqueous growth composition and introducing said aqueous growth composition into said distributing manifold and thence into said chamber as a fine mist for application to said plants, and repeating said time sequence.

4,514,931

SECURING DEVICE FOR MANHOLE COVER

Alfred Beck, and Piet Van Papeveld, both of Edmonton, Canada, assignors to Allied Flux Reclaiming Ltd., Alberta, Canada

Filed Jul. 2, 1984, Ser. No. 626,694
Int. Cl.³ E05F *15/20*
U.S. Cl. 49—21 **12 Claims**



1. A pressure release device for use with a manhole cover for releasing excess fluid pressure within a manhole or the like, said device comprising:

a tubular member having a tubular wall, fluid inlet means at one end thereof, fluid outlet means in said wall, means at the other end thereof for securing said member to said cover, and means for securing said member to said manhole adjacent a manhole opening for longitudinal movement of said member between a closed position whereat said cover closes said opening and an open position whereat said cover is removed from said opening permitting fluid flow from said manhole into said member via said inlet means and outwardly of said member and said manhole opening via said outlet means, said securing means permitting movement of said member from said closed position at a predetermined fluid pressure within said manhole and permitting said member to return to said closed position when said fluid pressure drops below said predetermined pressure.

4,514,932

SECURITY SYSTEM WINDOW GUARD APPARATUS AND ANCHOR ASSEMBLY THEREFOR

James Janis, 4104 N. Reno, Tucson, Ariz. 85705

Filed Sep. 30, 1982, Ser. No. 430,402
Int. Cl.³ E06B *9/00*
U.S. Cl. 49—50 **19 Claims**

15. An anchoring apparatus for a window guard grill comprising, in combination:

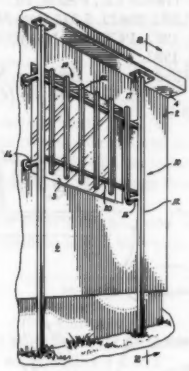
a pair of elongated vertical support members operably disposed on each side of a window to be protected and spaced a predetermined distance away from and substantially parallel to an outer wall, each of said pair of vertical support members including an upper end portion and a lower end portion;

means for fixedly anchoring the lower end portion of each of said pair of vertical support members underground for preventing easy access thereto;

means for fixedly securing the top end portion of said pair of said vertical support members to a roof overhang;

said window guard grill including a plurality of substantially vertical and horizontally oriented bars spaced such that a person cannot gain access to the window therethrough;

means for fixedly securing the opposite sides of said window guard grill to corresponding ones of said pair of elongated vertical support members for fixedly positioning said window guard grill over said window to be protected and



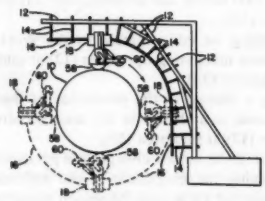
a predetermined fixed distance from said window and substantially parallel thereto, said distance being such that a person cannot squeeze between the window guard grill and the wall to gain access to said window.

4,514,933

SELF-BALANCED SURFACE-PROCESSING APPARATUS

Theodore N. Baskett, 9514 Portland Ave., Tacoma, Wash. 98441

Filed Aug. 23, 1982, Ser. No. 410,335
Int. Cl.³ B24B *17/00*
U.S. Cl. 51—32 **7 Claims**



1. A surface processing apparatus, comprising:

(a) a frame,

(b) a track mounted on the frame a spaced distance from the surface to be processed,

(c) a carriage on the track movable along the latter,

(d) a tool support,

(e) a surface processing tool mounted on the tool support,

(f) powered extension means directly interconnecting the carriage and the tool support and operable to move the latter to move the processing tool toward and away from a surface to be processed,

(g) extension control means for controlling movement of the extension means, and

(h) sensor means operatively associated with the extension control means and tool support and operable upon changing of the distance between the track and surface to be processed to operate the extension means to move the tool support in the direction to maintain substantially constant surface contacting pressure of the processing tool against the surface to be processed.

4,514,934

METHOD AND APPARATUS FOR ABRASIVELY MACHINING A WORKPIECE

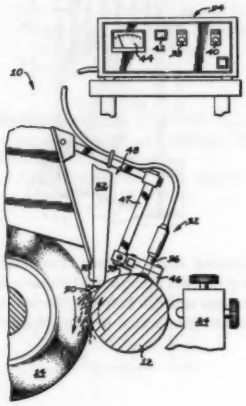
Robert W. Ray, and Rex G. Pierce, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00623, § 371 Date May 10, 1982, § 102(e) Date May 10, 1982, PCT Pub. No. WO83/03994, PCT Pub. Date Nov. 24, 1983

PCT Filed May 10, 1982, Ser. No. 394,731

Int. Cl.³ B24B *49/14*

U.S. Cl. 51—165 R **14 Claims**



1. In a method for abrasively machining a workpiece **(12)** by contacting the workpiece **(12)** with an abrasive tool **(14)** and moving at least one of the workpiece **(12)** and the tool **(14)** relative to the other, the improvement comprising:

directing a flow of coolant **(50)** to the workpiece **(12)** at an area **(33)** where the abrasive tool **(14)** contacts the workpiece **(12)**;

establishing an eddy-current in the workpiece during an abrasive machining operation **(12)** at said area **(33)** on the workpiece **(12)**;

sensing a change in the properties of the eddy-current in response to a change in the microstructure of the workpiece **(12)** at said area **(33)**;

comparing the sensed change to a preselected value;

determining the magnitude of the difference between the preselected value and the sensed value; and,

controlling the abrasive machining operation in response to said sensed change in microstructure.

4,514,935

SCANNING DEVICE FOR A MACHINE FOR THE AUTOMATIC SHARPENING OF BROACHING OR REAMING TOOLS

Roland Börner, Schellberger Weg 43, and Herbert Holstein, Felder Strasse 65, both of D-5650 Solingen 1, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 399,885

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131511

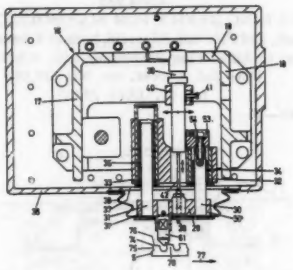
Int. Cl.³ B24B *49/00*

U.S. Cl. 51—165 R **8 Claims**

1. A scanning device for a machine for the automatic sharpening of broaching or reaming tools, including a driven horizontal slide for receiving a tool which is to be sharpened and a driven vertical slide provided with at least one grinding spindle mounted on a grinding slide, said scanning device comprising:

means for mounting said scanning device on said grinding slide;

means, including a scanning finger movable relative to the scanning device, for detecting the position of a given tooth of the tool being ground, said detecting means further including two sliding members displaceable at right angles to one another in a substantially vertical plane,



means for mounting said scanning finger upon one of said sliding members,

and displacement pickup means associated with each sliding member for detecting the displacement pickup distance travelled by the respective sliding member beginning at its position of rest, said displacement pickup means emitting displacement-dependent signals for triggering drive mechanisms for the machine slides.

4,514,936

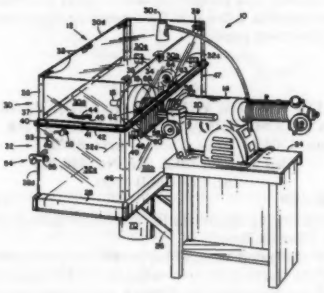
LATHE DUST ENCLOSURE

Ruben G. Hurtado, 106 Sylvia, San Antonio, Tex. 78237

Filed Oct. 19, 1983, Ser. No. 543,308

Int. Cl.³ B24B *55/06*

U.S. Cl. 51—270 **12 Claims**



1. Apparatus for collecting airborne particles produced during the operation of a drum and disc lathe, comprising:

a housing adapted to be substantially sealed comprising a ceiling, a floor, and a plurality of sides, at least one of said sides being adapted to receive therethrough an arbor of said lathe and a cutting tool;

means for removing said airborne particles from said housing; and

means for collecting said airborne particles exterior to said housing.

4,514,937

METHOD FOR THE SURFACE TREATMENT OF MAGNETIC RECORDING MEDIA

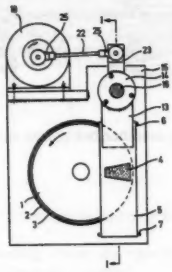
Manfred Gehrung, Grossniedesheim; Klaus Schoettle, Heidelberg; Helmut Kreissler, Oberkirch; Peter Rudolf, Fussgoenheim; Joachim Hack, Ludwigshafen, and Friedrich Anslinger, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,504

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3103874

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—281 SF 4 Claims



1. A method of treating the surface of magnetic recording media by burnishing, comprising: applying relative movement between the surface to be burnished and an abrasive member, pressing the abrasive member against the said surface, commencing with an unused portion of said abrasive member against a portion of said surface and controlling the pressure with which the said abrasive member portion is applied to said portion of said surface during the burnishing operation by burnishing at a lower burnishing pressure and then increasing from said one pressure up to a maximum burnishing pressure as the abrasive member portion in contact with the surface said portion of surface becomes loaded with abraded material from said surface and then reducing to less than the maximum pressure, and wherein the increase in the applied pressure occurs with a decrease in the abrasiveness of the abrasive member.

4,514,938

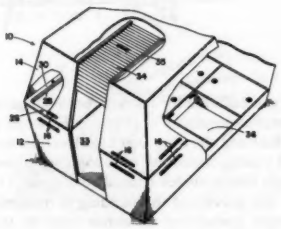
PORTABLE BUILDING STRUCTURE

Edward D. Maguire, P.O. Box 4950, San Rafael, Calif. 94903

Filed Mar. 7, 1983, Ser. No. 473,034

Int. Cl.³ E04H *1/12*

U.S. Cl. 52—79.4 3 Claims



1. A building structure comprising:

a pair of nestable, top and bottom frusto-pyramid shells;

each of said shells including a generally rectangular horizontal panel with generally upright side and end panels around the periphery thereof;

said side and end panels sloping outward from said horizontal panel at substantially equal angles thereto to form a frusto-pyramid;

means forming a peripheral lip including generally horizontal surface portions around the edges of said side and end panels;

a fastening means for securing together the lips of said shells in face to face engagement to form a complete enclosure, witn the horizontal panels of said top and bottom shells forming roof and base panels, respectively;

a floor panel above said base panel forming a stabilizer compartment therebetween;

a fluid inlet in one of said side and end panels to introduce stabilizing fluid into said stabilizer compartment;

means forming aligned door openings through said top and bottom shells;

a slideway on said shells along said door opening; and

a door slidably mounted in said slideway.

4,514,939

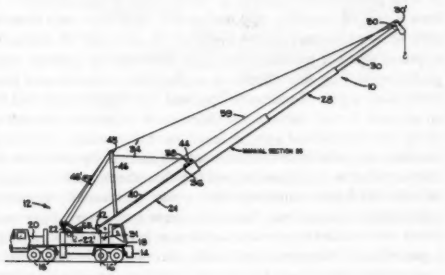
EXTENSIBLE BOOM WITH MANUAL SECTION STORED IN BASE

Robert A. Rathe, Cedar Rapids, and Thomas J. Volkmann, Hiawatha, both of Iowa, assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 293,728, Aug. 17, 1981, abandoned. This application Sep. 10, 1984, Ser. No. 648,619

Int. Cl.³ E04H *12/34*

U.S. Cl. 52—118 4 Claims



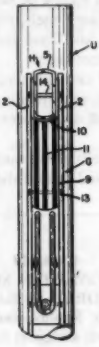
1. An extensible telescopic boom for a crane or the like comprising means defining a tubular base section; means supporting said base section for pivotal movement about a horizontal axis; means defining a manual section telescopically received in said base section; means defining at least one additional boom section telescopically received in said manual section; power means having a single cylinder case anchored to and movable with said additional section and having a piston rod; coupling means for selectively coupling said piston rod of said cylinder to said base section for selectively extending or retracting said manual section relative to said base section, or for coupling said piston rod to said manual section when disconnected from said base section for extending and retracting said at least one additional section relative to said manual section; means for locking said manual section in one of a plurality of selected positions; said at least one additional section including said additional section and a tip section telescopically received in said additional section; and extend-retract connecting means continuously and operatively connecting said manual section, said additional section, and said tip section to said single cylinder case and responsive to extension of said single cylinder and said additional section for proportionally extending said tip section and said additional section relative to said manual section.

4,514,940

SHORING SYSTEM

Henry J. Manderla, Burlington, Canada, assignor to Anthes Equipment Limited, Mississauga, Canada

Filed Apr. 5, 1982, Ser. No. 365,321
Claims priority, application Canada, Feb. 25, 1982, 397031
Int. Cl.³ E04D *15/00*; E04H *12/00*
U.S. Cl. 52—126.1 **3 Claims**



1. A shoring system including a plurality of vertically extending frames each including a pair of mutually opposed upright members each said upright member having a pair of spaced integral projecting side cheeks extending longitudinally at least partially throughout its associated upright member; at least a pair of mutually opposed gusset members each detachably secured to an upright member of said pair of mutually opposed upright members between said pair of spaced, integrally projecting side cheeks at a selectable location; and provided with a pair of mutually opposed side faces connected by an arcuate lower surface provided with striations extending along its longitudinal axis; at least one horizontally extending member opposite ends of which are supported by and detachably secured to said gussets, and the side cheeks, said horizontal member being constituted by a pair of mutually opposed substantially planar side faces connected at their upper and lower extremeties by convex surfaces at least one of which has a plurality of striations extending parallel with the central longitudinal axis of said horizontal member; and a lock, including a horizontally extending bolt, secured to each said pair of said vertical cheeks and adapted to receive and retain apertured cross-braces between horizontally spaced pairs of said frame members, said bolt receiving said cross-braces thereon.

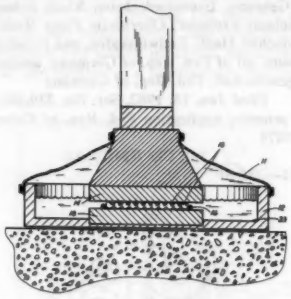
4,514,941

ASEISMIC SLIDERS

Manuel Gonzalez Flores, Uruapan 3, Mexico 7, D.F., Mexico

Continuation-in-part of Ser. No. 35,192, May 2, 1979, abandoned. This application Dec. 24, 1981, Ser. No. 334,397
Claims priority, application Mexico, May 2, 1978, 173291
Int. Cl.³ E02D *27/34*
U.S. Cl. 52—167 **4 Claims**

1. An improved aseismic slider construction for a building or other large structure to isolate the structure from horizontal ground movement resulting from seismic waves caused by earthquakes, including supporting means for the structure having a sliding element adapted to slide when horizontal ground movement occurs and to maintain the structure substantially free from horizontal movement due to its inertia; in which the improved construction comprises three horizontal portions, including a lower plate for contact with the ground, an upper plate for supporting the building structure, and a plurality of identical hard spherical balls located between and contacting said upper and lower plates, said balls being confined to the area within a ring member also located between said plates and extending over and contracting each other in



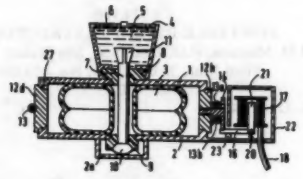
said area, said ring member being free to move together with the balls.

4,514,942

DAMPING INSTALLATION FOR EARTHQUAKE-ENDANGERED BUILDINGS

Adrian Pocanschi, Hauptmannreute 94, Stuttgart 1, Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,241
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151011
Int. Cl.³ E02D *27/34*; E04B *1/98*; E04H *9/02*
U.S. Cl. 52—167 **5 Claims**



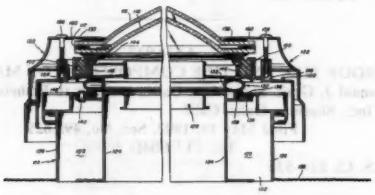
1. Damping installation for earthquake-endangered buildings where a vabration insulator is arranged between the foundation and the building showing that the vibration insulator rests in an overall casing consisting of a top casing and a bottom casing through which, under normal conditions, i.e. excluding earthquakes, the gravity of the building is transmitted mainly through a rigid connection of minor load to the vibration insulator and that the connection between the top and bottom section severs in an earthquake, thereby loading the vibration insulator wherein the detachable connection is formed by spacer wedges in the vertical sections of the casing which, under normal conditions, are held in position by a closure ring, the ring having a plane of weakness breaking by the agency of an earthquake.

4,514,943

THERMAL BREAK SKYLIGHT

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Division of Ser. No. 175,305, Aug. 4, 1980, Pat. No. 4,388,784.
This application Dec. 27, 1982, Ser. No. 453,349
The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.
Int. Cl.³ E04B 7/18; E06B 7/14, 7/98
U.S. Cl. 52—200 26 Claims



1. A skylight construction for an opening in a building comprising;

a frame means extending about the opening and including means securable about the opening,

translucent or transparent means covering the opening and extending at edges to overlie the frame means,

means for retaining the covering means on the frame means,

said frame means comprising a base frame and a support frame overlying the base frame,

and a compliant sealing means extending contiguously about and overlying the base frame and for sealing between the base frame and support frame,

said base frame having thermal break means for minimizing heat transfer through the base frame,

said support frame including an inner frame section, an outer frame section and second thermal break means disposed between and joining the inner and outer frame sections,

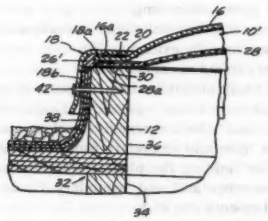
said thermal break means being non-metallic and extending between the inner and outer frame sections about the periphery thereof.

4,514,944

SKYLIGHT AND MOUNTING THEREFOR

Aubrey C. Doell, Newport Beach, Calif., assignor to Bristol Fiberlite Industries, Santa Ana, Calif.

Continuation of Ser. No. 352,406, Feb. 25, 1982, abandoned.
This application Jan. 20, 1984, Ser. No. 572,138
Int. Cl.³ E04B 7/18
U.S. Cl. 52—200 7 Claims



1. In a skylight structure which includes a preformed plastic dome with an integral outwardly extending peripheral flange, a plastic mounting skirt having integral angularly related flanges, one of which extends inwardly and is positioned in overlying spaced lapped relation with respect to said outwardly extending peripheral flange, and an initially flowable bonding medium fixedly secures the overlapped flanges together and encompasses the outer edge of the outwardly extending peripheral flange and extends into the space between the confronting surfaces of the overlapped flanges to an inner locus edge spaced from the adjacent inner edge of the associated skirt flange, the improvement comprising:

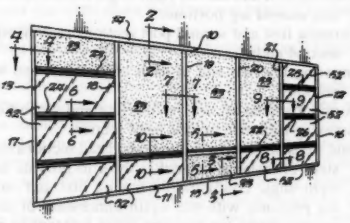
a sealing strip coextensive with said locus edge, and having sealing surface engagements with the confronting surfaces of said overlapping flanges and said locus edge of said bonding medium, whereby to form a protective seal against the entrance of outside moisture into the space between the confronting surfaces and the locus edge of the bonding material.

4,514,945

WINDOW INSULATING SYSTEM

Robert J. Menchetti, Kenmore, and Gale E. Sauer, Williamsville, both of N.Y., assignors to Donn Incorporated, Westlake, Ohio

Filed Jun. 23, 1981, Ser. No. 276,469
Int. Cl.³ E06B 3/26, 3/28
U.S. Cl. 52—202 16 Claims



1. A window insulating system capable of being assembled to cover a window assembly mounted within a window wall opening in a building wall, said opening being defined by horizontally extending top and bottom surfaces and vertically extending side surfaces, each of said top, bottom and side surfaces, extending inwardly of said opening; said system when assembled including:

at least one generally rectangular insulating panel having inner and outer faces, upper, lower and opposite side edges, and an intermediate core of insulating material;

vertical channel members having a generally U-shaped cross section and normally adapted to be positioned on the opposite side edges of the insulating panel and in gripping engagement with the inner and outer faces of the insulating panel; and

upper and lower horizontal channel members adapted to be mounted on the horizontally extending top and bottom surfaces, each of said horizontal channel members having a generally U-shaped cross section defining an opening in which an edge of an insulating panel is adapted to be removably received, and including inner and outer legs with said outer legs adapted to be disposed closest to said window assembly;

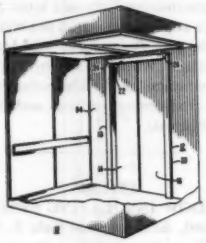
the parts being so arranged and constructed that when the system is assembled an insulating panel is removably positioned adjacent to but spaced from the interior side of the window assembly and has its lower edge resting within said horizontal lower channel member and its upper edge within said upper horizontal channel member, and the vertical channel members are supported by said opposite side edges and are disposed adjacent the side surfaces of said window wall opening.

4,514,946

ARCHITRAVE

Edward F. Sherwood, Gettysburg; Karl B. Orndorff, Bonneauville, both of Pa., and Charles M. Dillon, Emmitsburg, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1983, Ser. No. 488,307
Int. Cl.³ E06B 1/04
U.S. Cl. 52—211 **1 Claim**



1. A method of constructing a mitered architrave for insertion into an opening in a wall of an elevator car, comprising the steps of:

forming first and second right angle frames each having first and second leg portions,

forming first and second post sections each having first and second ends,

mitering the first end of each of said first and second post sections,

forming a head section having first and second ends,

mitering each end of said head section,

said steps of forming the post and head sections including the steps of forming a metallic sheet to provide an L-shaped right angle configuration having first and second major leg portions, with the width dimensions of said first and second major leg portions being selected to provide the desired jamb depth and reveal width, respectively, of the architrave,

said steps of forming the post and head sections further including the steps of bending each of the first and second major leg portions to provide first and second right angle anchoring flanges which function to secure the post and head sections to both the wall of an elevator cab, and to the right angle frames, with the first right angle flange extending from the first major leg portion in the same direction as the second major leg portion, and with the second right angle flange extending from the second major leg portion in the same direction as the first major leg portion,

said steps of forming the post and head sections creating cross sectional configurations for the associated section which define an only partially enclosed elongated recess configured and dimensioned to snugly accept a leg portion of a right angle frame,

inserting the first leg portions of the first and second right angle frames into the partially enclosed recesses at the mitered first ends of the first and second post sections,

inserting the second leg portion of the first right angle frame into the partially enclosed recess at the first mitered end of the head section, to tightly butt the adjoining mitered ends of the head section and first post section,

inserting the second leg portion of the second right angle frame into the partially enclosed recess at the second mitered end of the head section, to tightly butt the adjoining mitered ends of the head section and second post section,

securing the first and second right angle anchoring flanges of the first and second post sections to the first leg portions of the first and second right angle frames, respectively, and

securing the first and second right angle anchoring flanges of the head section to the second leg portions of the first and second right angled frames,

said first and second right angle anchoring flanges being adapted to secure the architrave within an opening of an elevator cab, with a portion of the second right angle anchoring flange functioning as a wall return from the reveal defined by the second major leg portion,

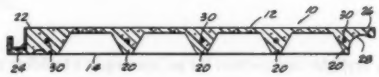
said securing steps including the steps of applying fastener means to predetermined locations of the first and second right angle anchoring flanges which are concealed when the architrave is installed in an opening of a wall of an elevator car.

4,514,947

ROOF TILE AND TILE COMPOSITION OF MATTER

Donald J. Grail, Santa Ana, Calif., assignor to Embelton-Grail, Inc., Sherman Oaks, Calif.

Filed May 18, 1983, Ser. No. 495,829
Int. Cl.³ E04D 1/00
U.S. Cl. 52—536 **5 Claims**



1. A roof tile comprising:

a top surface, a bottom surface, a top end, a butt end, said top and bottom surfaces being tapered towards each other from said butt end to said top end, said roof tile being provided with one longitudinal side edge having a longitudinal flange, and another longitudinal edge having a longitudinal concavity;

a plurality of spaced longitudinal ribs each of equal width and depth formed in said bottom surface and extending continously from said butt end to said top end;

longitudinal reinforcing wire embedded in each of said ribs;

longitudinal reinforcing wire embedded in the bottom perimeter of said roof tile and in the same plane as said wire embedded in said ribs; and

means for securing said tile to a roof.

4,514,948

THERMAL BREAK FRAME WITH LOAD TRANSFER MEMBER

William Meigs; David M. Guffey, and Donald E. Brumfield, all of Selma, Ala., assignors to Disco Aluminum Products Co., Inc., Selma, Ala.

Filed Jun. 1, 1982, Ser. No. 384,069
Int. Cl.³ E02D 27/00
U.S. Cl. 52—397 **6 Claims**

1. A thermal break frame for supporting a planar object such as a pane of glass, comprising:

a main frame member including a laterally extending portion and a horizontally extending lip;

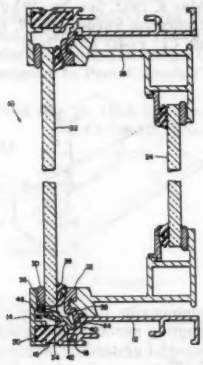
a secondary frame member;

a thermal break material which supports in spaced relationship said main frame member and said secondary frame member and which thermally insulates said main frame member from said secondary frame member;

a means for holding the planar object between said main frame member and said secondary frame member in a vertical orientation; and

a load transfer member including a flat horizontal surface, and a laterally and downwardly extending portion having a distal end, said extending portion bearing against said laterally extending portion of said main frame member, and said distal end of said downwardly extending portion being located beneath and bearing against said horizon-

tally extending lip, whereby said load transfer member is supported by said main frame member and in turn supports the weight of the planar object such that the weight of the planar object is borne by said main frame member.



4,514,949

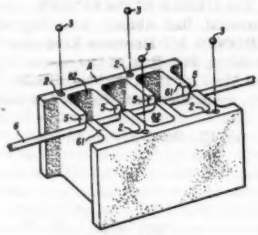
INTERLOCKING SYSTEM FOR BUILDING WALLS

Jorge L. N. Crespo, 809 Managua St., San Juan, P.R. 00921

Filed May 6, 1983, Ser. No. 492,132

Int. Cl.³ E04C *1/10*

U.S. Cl. 52—585 **9 Claims**



1. A wall comprising superposed rows of longitudinally aligned building blocks, said blocks having approximately parallel front and back faces connected by a plurality of transverse webs defining chambers between said webs, the top and bottom of said front and back faces being approximately parallel and providing longitudinally extending tops and bottoms for said blocks, said tops and bottoms being formed to include uniformly spaced apart ball-receiving depressions positioned so that the depressions in the tops of each block mate with the depressions in the bottoms of the block above it, balls fitted into the space defined by mating depressions, said balls being slightly larger than said mating depressions to space the blocks, the depressions in the tops of each block being machined to a specific depth in relation to the height of the block so that the interconnection of said blocks by said balls provides horizontal alignment for each ball-supported block, the upper face of said webs being formed with longitudinally aligned V-shaped grooves which are accurately positiond at a uniform distance from the front faces of said blocks, and elongated straight bars of circular cross-section fitted in said grooves and extending longitudinally and horizontally from one block to the next to provide longitudinal alignment of the blocks in each row.

4,514,950

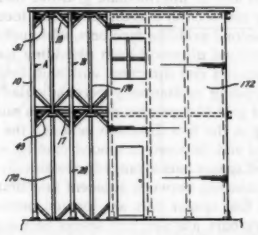
BUILDING FRAMING SYSTEM AND METHOD

Albert A. Goodson, Jr., 13923 Myrtlea, Houston, Tex. 77079

Filed Nov. 27, 1981, Ser. No. 325,283

Int. Cl.³ E04H *12/00*

U.S. Cl. 52—648 **8 Claims**



1. A structural framework for a multi-story building having a foundation comprising:

first and second multi-story framing units, each said framing unit having at least two unitary vertical load bearing column/studs and at least one horizontal joist, each of said unitary column/studs extending from the foundation to the top of the multi-story building and being a C-shaped steel member;

a first bolted connection connecting the ends of said horizontal joist to said column/studs;

a plurality of horizontal spacer members extending between said first and second framing units, a second bolted connection connecting one end of said spacer members to said first framing unit and a third bolted connection connecting the other end of said spacer members to said second framing unit, said third bolted connection including a support bracket having an angle-like body with a horizontal projecting flange, said angle-like body being received within said column/stud and bolted thereto, said horizontal projecting flange being bolted to a web of said spacer member;

means for anchoring the lowermost ends of said column/studs to the foundation;

said horizontal joists and spacer members forming supports for floors and a roof;

a plurality of nonaxial load bearing studs extending vertically between said spacer members, said nonaxial load bearing studs being arranged for support of wall collateral materials; and

interior bridging members extending between adjacent framing units and interior of said spacer members, said interior bridging members being connected to said joists by a fourth bolted connection including angle iron supports having one flange bolted to said joists and the other flange bolted to said web of said interior bridging members.

4,514,951

GUARD GRID FOR A PASSAGEWAY

Helmut Eder, Triesen, Liechtenstein, assignor to Multisafe AG, Schaan, Liechtenstein

Filed Jul. 7, 1983, Ser. No. 511,668

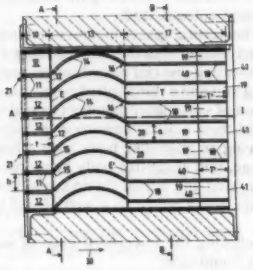
Claims priority, application Switzerland, Jul. 9, 1982, 4184/82

Int. Cl.³ F24F *13/00*

U.S. Cl. 52—660 **10 Claims**

1. A guard grid for use in a ventilating shaft and similar passageway, such as in structures with a considerable wall thickness, said guard grid comprising a plurality of different grid-like members provided one following the other in the direction of the passageway through a wall, said guard grid having a first end and a second end spaced apart in the direction of the passageway and a pair of first sides extending between the first and second end spaced apart in the direction

extending transversely of the first end-second end direction and a pair of second sides extending between the first and second ends and spaced apart transversely of the first end-second end direction and extending transversely of the first sides, a first grid-like member extending from the first end toward the second end of said guard grid, a second grid-like member extending from the second end toward the first end of said guard-grid and an intermediate grid-like member extending in the first end-second end direction and located between said first and second grid-like members, said guard grid having a first and a second direction each extending transversely of the first end-second end direction with said first and second directions extending substantially perpendicularly of one another, said first grid-like member comprising a plurality of first bars extending in the first direction between the first sides of said guard grid and disposed in spaced parallel relation and a plurality of first spacer bars arranged substantially perpendicularly to and extending between adjacent said first bars so that a row of said first spacer bars are located between adjacent pairs of said first bars, and said first spacer bars in adjacent said rows being offset, said first bars and first spacer bars form a honeycomb-like structure with the dimension in the first end-second end direction equal at least to the dimension of said first spacer bars extending in the direction between the second sides of said guard grid, said intermediate grid-like member including a plurality of cross-members disposed in spaced parallel relation extending between the first sides of said guard grid and said cross-members being bent in the plane extending in the



first end-second end direction and in the direction between the second sides of said guard grid so that each of said cross-members has a first surface facing toward one of said second sides and a second surface facing toward the other of said second sides, each said cross member has a first edge and a second edge spaced from the first edge in the first end-second end direction and said first edge is located adjacent to the edges of said bars of said first grid-like member more remote from the first end of said guard grid, said second edge of each said cross-members is offset relative to the first edge of the same said cross-member in the direction between the second sides of said guard grid, and the dimension of said cross-member in the first end-second end direction is at least twice the dimension of said first bars extending in the first and second end direction, and said second grid-like member comprising a plurality of plates disposed in spaced parallel relation and extending between the first sides of said guard grid and in the first end-second end direction, a plurality of spacer struts each arranged perpendicularly to a pair of adjacent said plates extending in the first end-second end direction with a row of said spacer struts located between each pair of adjacent said plates, said spacer struts in adjacent said rows thereof being offset, said plates and spacer struts forming a honeycomb-like structure with the dimension in the first end-second end direction being a multiple dimension of said spacer struts in the direction between said second sides, and said plates having a first edge extending between said first sides of said guard grid adjacent the second edge of said cross-members.

4,514,952

ROOF PANEL MOUNTING CLIP

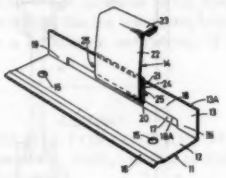
Bengt Johansson, Blidö, Sweden, assignor to Maskingruppen 82 AB, Täby, Sweden

Filed May 9, 1983, Ser. No. 493,037

Claims priority, application Sweden, Jul. 8, 1982, 8204222

Int. Cl.³ E04D *1/00, 1/34*

U.S. Cl. 52—713 **7 Claims**



1. Roof panel mounting clip, comprising

a sheet metal anchoring member having a horizontal base flange and an integral upstanding web with a horizontal upper edge and a horizontal closed slot defining with said upper edge a bridge in said web, and

a tab member formed of a sheet metal strip substantially narrower than the horizontal extent of said slot, one end portion of said strip being folded a full turn about said bridge and having its terminal edge of said turn directed downwardly and spaced between said upstanding web and an upstanding portion of said tab member, the other end portion of said strip being adapted to be engaged with a roof panel.

4,514,953

DEVICE FOR REMOVING AIR FROM FILLED BOTTLES OR OTHER CONTAINERS

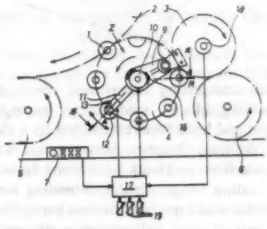
Hans-Jürgen Patzwahl, Bad Abbach, Fed. Rep. of Germany, assignor to KRONES AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,282

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311200

Int. Cl.³ B65B *31/04, 57/00*

U.S. Cl. 53—52 **8 Claims**



1. Apparatus for displacing air from above the fill level in containers such as bottles that are in transit to a container closing unit, comprising:

a nozzle located for injecting a jet of a medium into the moving open container to effect said air displacement and movable means to which said nozzle is mounted for being moved selectively closer to and farther from said container closing unit,

means for determining the speed at which said containers are transported and drive means controlled by speed determining means to drive said moveable means to locate said nozzle farther from said container closing unit for increasing transport speed and closer to said closing unit for decreasing transport speed so that the elapsed time be-

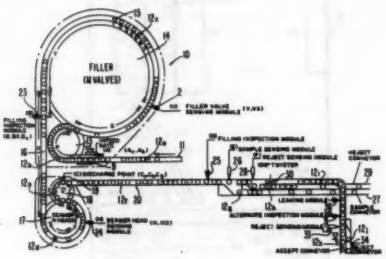
tween injecting said medium and closing of the containers remains substantially constant.

4,514,954

FILLER LINE MONITORING SYSTEM

F. Allan Anderson, San Francisco; Henry C. J. Chen, Fremont; Vito A. DiMucci, Saratoga, and Roger C. Wang, San Jose, all of Calif., assignors to Peco Controls Corporation, Milpitas, Calif.

Filed Jan. 31, 1983, Ser. No. 462,640
Int. Cl.³ B65B *57/00*
U.S. Cl. 53—53 **21 Claims**



1. A monitoring and control system for a fluid container filler line having an empty container in-feed conveyor, a multi-valve rotary fill station, a multi-head seamer station to close and seal the then filled containers, a discharge conveyor and a fill height detector for under and overfill detection of liquid within said containers, said monitoring and control system comprising;

(a) first sensor means located to indicate the first valve of a sequence of numbered fill valves in said fill station and means to reset a valve counter to each time increment that said first valve passes said first sensor means;

(b) second sensor means located to count each valve of the sequence of fill valves; a signal from said second sensor means triggering a valve counter;

(c) controller means responsive to said first and second sensor means and said valve counter to spacially track each of said containers through said system and to identify the particular fill valve for each particular container; and

(d) detector means responsive to said controller means and fault signals from said fill height detector to detect an improperly filled faulty container and the particular numbered valve which filled said faulty container.

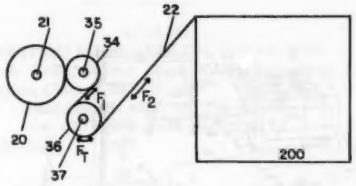
4,514,955

FEEDBACK CONTROLLED STRETCH WRAPPING APPARATUS AND PROCESS

Curtis A. Mouser, Louisville; Mark G. Roberts, Middletown; Daniel R. Haas, Louisville, and Patrick R. Lancaster, III, Anchorage, all of Ky., assignors to Lantech, Inc., Louisville, Ky.

Filed Apr. 6, 1981, Ser. No. 250,926
Int. Cl.³ B65B *11/02, 57/04*
U.S. Cl. 53—64 **29 Claims**

1. An apparatus for making a unitary package using a web of stretchable plastic material to form an overwrap, comprising a frame, plastic material dispensing means mounted to said frame, drive means to provide relative rotation between said load and said material dispensing means thereby to pull said plastic material from said material dispensing means and wrap said load, material elongation means positioned between said dispensing means and said load, said material elongation means comprising at least a rotating upstream roller and a rotating downstream roller to receive said plastic material and elongate said plastic material pulled across said rollers to wrap said load, and material elongating control means connected to said material elongation means and comprising means to determine and apply a restraint force on said upstream roller, to determine actual elongation of said material by sensing speeds of said rollers in said material elongation means, and to vary said restraint force to maintain elongation of said material within said material elonation means substantially at an infinitely



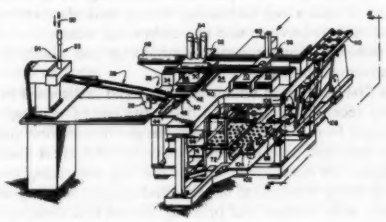
variable predetermined constant elongation level, and means to apply to and sense at said downstream roller a power assistance force and means to vary said power assistance force so that said varied restraint force less said varied power assistance force, which equal wrapping force on said load, is maintained substantially at an infinitely variable predetermined constant force level.

4,514,956

VACUUM TRANSFER APPARATUS FOR PACKING LAYERS OF ARTICLES IN A CONTAINER

Thomas P. Varallo, Beaumont, Tex.; Albert W. G. Ervine, Bridgeport, Conn.; Joseph J. Duffy, Newark, Del., and Edwin G. Olson, Cabot, Ark., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 5, 1982, Ser. No. 355,230
Int. Cl.³ B65B *35/56, 19/34*
U.S. Cl. 53—148 **19 Claims**



1. Apparatus for packing layers of cylindrical articles in a container comprising:

feeding means for delivering successive rows of a predetermined number of cylindrical articles oriented horizontally and arranged side-by-side to a staging area;

transition means for alternately vertically staggering the cylindrical articles in each row and for transferring a predetermined number of rows of alternately vertically staggered cylindrical articles to an accumulating area where they will collect as a layer; and

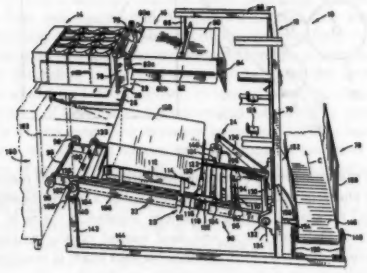
vacuum pickup means adapted to make vacuum-tight contact with the side of each cylindrical article in the accumulating area, means for lifting said pickup means so that the entire layer can be lifted in its staggered condition and transferred to a container at a loading station where it is released and forms an unstaggered horizontal and tightly packed layer in the container.

4,514,957

BAG LOADING MACHINE

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Feb. 3, 1983, Ser. No. 463,584
Int. Cl.[3] B65B 5/06, 43/52
U.S. Cl. 53—252 8 Claims



1. A bag loading machine comprising;

(a) a bag receiving station for receiving an open bag from a bag dispenser and a bag loading station for receiving a load from a load dispenser, said bag loading station being located directly above said bag receiving station,

(b) bag embracing means mounted and held fast in said bag loading station, said bag embracing means being adapted to embrace the upper, side and outer end walls of a bag and having an open lower end through which a loaded bag may be removed from said bag embracing means,

(c) receiver means adjacent said bag receiving station for receiving loaded bags,

(d) a bag transfer platform having a front end and a back end, said bag transfer platform underlying the open lower end of said a bag embracing means, said platform being movable relative to said bag embracing means,

(e) platform mounting means mounting said platform for movement between;

(I) a first position in which said front end is disposed in the bag receiving station, at a discharge end of said bag dispenser from which a bag is discharged bottom first and on its side, said platform being spaced a substantial distance below the open lower end of the bag embracing means and being arranged to underlie and support said bag on its side with its open end opening toward said front end of said platform;

(II) a second position disposed above said first position in a bag loading plane in which said platform is arranged to close said open lower end of said a bag embracing means and to cooperate therewith to retain a bag in said bag embracing means with its open end disposed toward said load dispenser means and in which said front end of said platform is disposed in a load receiving relationship with respect to said load dispenser means, movement of said platform from said first position to said second position resulting in said spacing being reduced; and

(III) a third position in which the discharge end of said platform is disposed below the front end and adjacent to the receiver means whereby a loaded bag may be discharged from the platform onto the receiver means,

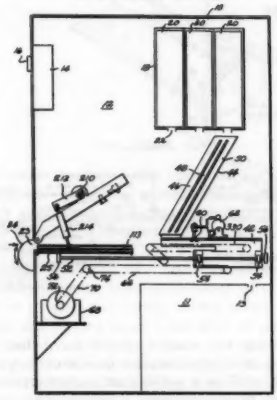
(f) drive means for sequentially driving said platform between the first, second and third positions and back to the first position.

4,514,958

AUTOMATIC X-RAY FILM CASSETTE UNLOADER AND RELOADER

Willem A. Hoorn, Amersfoort, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 24, 1982, Ser. No. 444,087
Int. Cl.[3] B65B 5/10, 43/38; B65H 1/00
U.S. Cl. 53—266 R 10 Claims



1. An apparatus for automatically unloading exposed film from an X-ray film cassette and reloading with unexposed film, comprising

a light-tight chamber having an entry slot for insertion and withdrawal of X-ray film cassettes, and an access gate adapted to cover and uncover said slot;

a film-holding magazine rack support mounted in said chamber;

a plurality of refillable film-holding magazines positioned on said support, each containing a substantially vertical stack of unexposed X-ray film sheets of a predetermined size, and each further comprising an associated release mechanism, which combination functions to release on demand a single sheet of predetermined size film;

a film transport carriage mounted below the magazine rack support and moveable between a first predetermined position below said rack support and a second position spaced horizontally therefrom in the direction of the entry slot, said film transport carriage being equipped with (1) a first film-receiving means to receive and temporarily store an X-ray film sheet released from the film-holding magazine, and (2) film gripping means for removal of exposed film from a cassette,

a cassette-receiving and sizing rack mounted within said chamber, and communicating with the outside of said chamber through said entry slot;

cassette-opening means mounted within said chamber and positioned over said cassette-receiving and sizing rack, designed to open the lid of a cassette and hold it in an open position, the raised lid of the opened cassette defining the aforesaid second position;

actuating means to move the film transport carriage between said first and second positions,

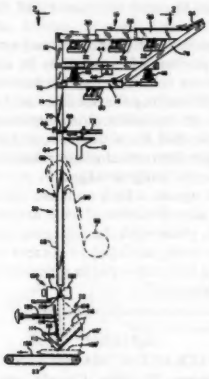
a second film receiving means in said chamber,

and means to release the exposed film sheet from the film transport carriage into said second film receiving means.

4,514,959
APPARATUS AND METHOD FOR ALIGNING AND PACKAGING ELONGATED ARTICLES

David Shroyer, Aurora, Oreg., assignor to Lamb-Weston, Inc., Portland, Oreg.

Filed May 10, 1982, Ser. No. 376,515
Int. Cl.³ B65B 9/10, 13/20, 63/02
U.S. Cl. 53—428 26 Claims



1. Apparatus for aligning elongated articles, comprising:
alignment container means for aligning a plurality of elongated articles contained within said container means with their longitudinal axes substantially parallel;
first vibrating conveyor means for conveying said elongated articles into the alignment container means in a direction of travel which forms an acute angle with a wall of said container means;
said first conveyor means being divided longitudinally into a plurality of tracks defined by and separated by divider partitions extending to a position above said container means and each track having a track width which is less than the average length of the articles so that said articles are prealigned longitudinally in said tracks with their longitudinal axes substantially parallel to said direction of travel;
said alignment container means having an article inlet opening of a width less than the average length of said articles so that the majority of said articles strike the inner surface of said wall of said container means while they are in said tracks on said first conveyor means and are aligned substantially parallel with said wall before said articles drop from said first conveyor tracks directly into said container means through said inlet opening; and
first discharge means for discharging said articles from the bottom of said container as a batch of articles in an aligned condition.

4,514,960
IN-PACKAGE INSECTICIDAL BAIT PREPARATION UTILIZING MICROWAVE ENERGY

Karl Sears, Kendall Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

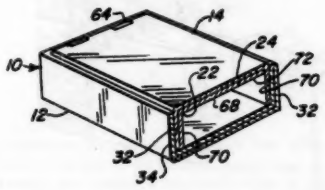
Filed Jul. 16, 1982, Ser. No. 399,030
Int. Cl.³ B65B 63/08
U.S. Cl. 53—440 5 Claims

1. A process for preparing a cohesive solid insecticidal bait composition within a dispensing package therefor which comprises:
(a) intimately mixing an insecticidal composition, a food attractant, a binder material. and a microwave-responsive material in the event the insecticidal composition, food attractant and binder material are not microwave-responsive, together into a paste-like material at a temperature below the melting point of said binder material;
(b) inserting said paste-like material into said package;
(c) treating said paste-like material-containing package with microwave energy for a period of time sufficient to cause said binder material to melt; and
(d) cooling said package to form a cohesive, solid insecticidal bait composition.

4,514,961
METHOD FOR HANDLING ENVELOPES

Raymond A. Gillie, Walnut Creek, Calif., assignor to Arvey Corporation, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,492
Int. Cl.³ B65B 25/14, 43/39, 43/40
U.S. Cl. 53—449 5 Claims



1. A method for the handling of unstuffed envelopes in a manner which facilitates the subsequent handling of the stuffed envelopes stuffed as pre-sorted mail, comprising the steps of:
(a) providing a telescopic carton assembly having a first carton and a second carton for telescopically receiving the first carton, wherein each of the first and second cartons are self-contained shipping containers having an outer panel providing a bottom for the carton, upright walls extending generally upwardly around the outer panel, and converting means for converting the carton from use as a separate self-contained shipping container to use as a carton as part of the telescopic carton assembly;
(b) placing unstuffed envelopes in the telescopic carton assembly for shipment of the unstuffed envelopes;
(c) separating the first carton from the second carton;
(d) removing the unstuffed envelopes from the first and/or second cartons;
(e) positioning the converting means of the first and second cartons to positions outside of the interiors of the respective first and second cartons;
(f) stuffing and sorting the envelopes as pre-sorted mail;
(g) placing a first portion of the envelopes stuffed as pre-sorted mail in the first carton and a second portion of the envelopes stuffed as pre-sorted mail in the second carton; and
(h) positioning the converting means of the first and second cartons so as to define the tops of self-contained shipping containers housing the stuffed envelopes for shipment of the pre-sorted mail.

4,514,962
METHOD AND APPARATUS FOR FILLING RECLOSABLE BAGS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,243
Int. Cl.³ B65B 43/12, 9/08
U.S. Cl. 53—457 18 Claims

1. A method of seriatim filling of closed bottom bags at a filling station, and wherein the bags are of the kind supplied in a chain and have closed sides and aligned tops closed by reclosable profiled fastener means from which a pair of confronting

lip flanges project upwardly and extend continuously along the top of the chain, comprising:

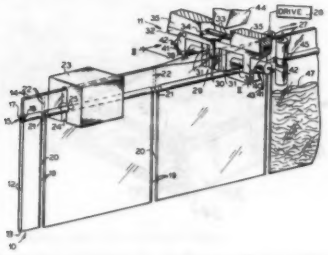
receiving each of said lip flanges between separable clamping means;

permitting relative movement of the lip flanges and the clamping means in an open phase of the clamping means;

firmly clamping said lip flanges in said clamping means in a clamping phase of the clamping means;

cyclically operating said clamping means through each of said phases, and in said clamping phase actuating the clamping means for pulling said lip flanges apart and thereby separating said reclosable fastener means of each bag at said bag filling station; and

after filling of each bag at said station advancing the filled bag from said station and reclosing the fastener means of the filled bag.



8. Apparatus including a filling station for seriatim filling of closed bottom bags of the kind supplied in a chain and wherein the bags have closed sides and aligned tops closed by reclosable profiled fastener means from which a pair of confronting lip flanges project upwardly and extend continuously along the top of the chain, and comprising:

separable clamping means for receiving each of said lip flanges therebetween and having an open phase permitting relative movement of the lip flanges and the clamping means, and a clamping phase wherein said lip flanges are firmly clamped by said clamping means;

means for cyclically operating said clamping means through each of said phases, and adapted in said clamping phase for actuating the clamping means for pulling said lip flanges apart and thereby separating said reclosable fastener means of each bag at said filling station; and

means for advancing each filled bag from said filling station and for reclosing said fastener means of the filled bag.

4,514,963

SYSTEM FOR REGULATING THE FEED OF ARTICLES TO A WRAPPING MACHINE

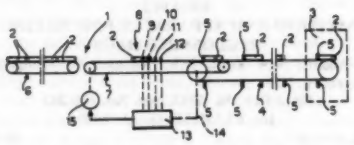
Carlo L. Bruno, Turin, Italy, assignor to Alisyncro S.p.A., Turin, Italy

Filed Jan. 5, 1983, Ser. No. 455,713

Claims priority, application Italy, Jan. 5, 1982, 67005 A/82

Int. Cl.³ B65B *1/30, 3/26, 57/00;* **B65G** *43/00*

U.S. Cl. 53—493 **4 Claims**



1. A system for regulating the feed of articles to a wrapping machine, comprising:

conveyor means for feeding a series of longitudinally spaced articles to the wrapping machine; said conveyor means including a first accumulation belt conveyor on which the articles are accumulated in an aligned condition and a second spacing belt conveyor having a length for supporting only a single article at a time thereon at the desired spacing, said second belt conveyor receiving the articles from the first accumulation belt conveyor and feeds said articles to the wrapping machine, said second belt conveyor having a speed greater than that of said first belt conveyor so as to cause the spacing of the articles from each other,

sensor means operable at predetermined time intervals for detecting the position of each article on said second spacing belt conveyor relative to said sensor means,

control means for varying the speed of said second spacing belt conveyor in dependence on output signals from the sensor means so that the articles are fed to the wrapping machine in a predetermined phase relationship therewith, said sensor means being arranged to provide a combination of on/off signals which contains the information on the degree of any deviation of each article from the correct position in phase with the wrapping machine and said control means being arranged to correct the speed of the second spacing belt conveyor in proportion to the degree of deviation detected.

4,514,964

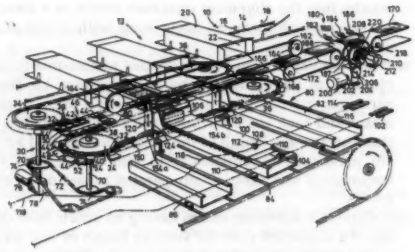
PACKAGING MACHINES

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Sep. 19, 1983, Ser. No. 533,070

Int. Cl.³ B65B *35/44, 35/50*

U.S. Cl. 53—540 **12 Claims**



1. In a packaging machine having a loading station in which load items are loaded into a container, the improvement of;

(a) a load transport conveyor having a forward run extending through said loading station in a first direction along a first path,

(b) a load supporting compartment formed on said conveyor, said compartment having a leading end and a trailing end,

(c) a discharge passage opening from the trailing end of said compartment,

(d) guide means at the trailing end of said compartment for guiding a load item toward said discharge passage,

(e) receiver means located in said loading station for receiving a load item discharged from said load supporting compartment,

(f) stop means located in said loading station and extending into said path upstream of said receiver means whereby the movement of a load item carried by said load supporting compartment along said path in said first direction is arrested by contact with said stop means and continued movement of the load transporting conveyor causes the load item to engage the guide means to be directed thereby through the discharge passage into the receiver means, and,

(g) means for discharging the load item from the receiver means.

4,514,965

APPARATUS FOR CONTINUOUSLY PACKING MEDICAL APPLIANCES FOR STERILIZATION

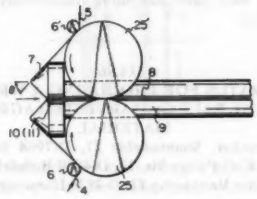
Kiyoshi Adachi, Otake; Masaru Uehara, Komaki; Hiroshi Kitagawa, Nagoya; Hirotaka Kojima, Kasugai, and Masaaki Sato, Nagoya, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Division of Ser. No. 207,900, Nov. 18, 1980, abandoned. This application Apr. 8, 1983, Ser. No. 483,108

Claims priority, application Japan, Nov. 19, 1979, 54-149702; Nov. 19, 1979, 54-149703; Nov. 19, 1979, 54-149704

Int. Cl.³ B65B *9/10*

U.S. Cl. 53—553 **3 Claims**



1. An apparatus for continuously packing medical appliances for sterilization, comprising:

means for delivering said appliances to said apparatus along a packing path in a packing direction;

means for supplying continuous packing sheets to said apparatus in said packing direction;

means for enclosing each of said appliances between two of said packing sheets;

means for sealing first edges of said packing sheets which are lateral to said packing direction;

means for sealing said packing sheets at sealing portions between said appliances in said packing direction;

means for cutting said sealed sheets at said sealing portions so as to form individual packets, wherein said means for enclosing comprise:

a cylinder having a longitudinal axis extending along said packing path in said packing direction;

a pair of longitudinal first slits in said cylinder, said slits extending along said packing direction and dividing said cylinder into two semi-cylinder portions which are symmetric about a plane defined by said slits; and

guide means fixed to each of said semi-cylinder portions at one axial end thereof, said guide means being separated by second slits coplanar with said first slits, whereby said means for supplying packing sheets supply one of said packing sheets to be turned over each of said guide means and passed through said first and second slits, wherein said guide means are each symmetric about said plane and each include a semiconical guide portion, each said guide portion extending axially from a respective said semi-cylinder portion and being angled from said feed direction by between 5° and 90°, wherein each of said guide means include flat extending portions confronting one another on either side of said plane and extending outward from said semi-cylinder portions in a radial direction, said second slits being equal in width to said first slits and comprising spaces between said flat extending portions.

4,514,966

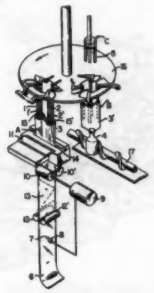
SHRINK BANDING MACHINE FOR USE WITH THIN FILM

Anatole E. Konstantin, 10 Live Oak Rd., Norwalk, Conn. 06851

Filed Dec. 2, 1982, Ser. No. 446,223

Int. Cl.³ B65B *13/16, 7/28, 5/00*

U.S. Cl. 53—585 **3 Claims**



1. Apparatus for placing a band of thin, shrinkable, plastic film over an article to be banded, comprising in combination;

(a) means for feeding a specified length of thin, shrinkable, plastic tubing flattened in a first plane,

(b) means for opening the flattened tubing and for refolding it in a second plane perpendicular to the first plane in such manner that the refolded tubing is substantially closed in the middle but open at the ends,

(c) means for feeding the specified length of substantially closed refolded tubing into position for being cut,

(d) means for cutting the specified length of said refolded into a band,

(e) means for conveying articles to be banded in timed sequence with said cut bands to a banding position, and after being banded to a heating tunnel to shrink fit the band tightly around the article,

said apparatus being characterized by band opening means capable of entering the open ends of refolded tubing that is substantially closed in the middle as said band is cut from said tubing and opening said band into a polygonal configuration, comprising: two sets of parallel fingers, each set containing at least two fingers and adapted to move in arcuate paths in the plane perpendicular to the axes of the fingers, from a contracted position at the two open ends of the band to an expanded position nearer the center of the band, thereby enabling the open ends of the substantially closed tubing to be slipped over the contracted fingers before the band is cut from the tubing, and enabling the fingers to expand against the inside surface of the band with sufficient force to open the band fully into a polygonal configuration and to hold the band on the expanded fingers.

4,514,967

BRIDGE SUPPORT FOR SECURING SULKY TO WALK-BEHIND MOWER

Joseph E. Scanland, Savannah, Ga., and David B. Skillman, Winston-Salem, N.C., assignors to Roper Corporation, Kankakee, Ill.

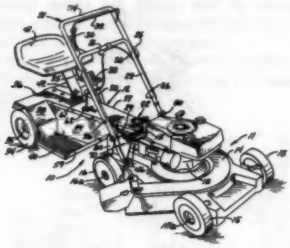
Filed Aug. 3, 1983, Ser. No. 520,020

Int. Cl.³ A01D *35/12, 35/262*

U.S. Cl. 56—14.7 **12 Claims**

1. An articulated riding mower comprising, in combination, a sulky having a frame, an operator's seat mounted on said frame, a pair of ground-engaging traction wheels for supporting the sulky frame, a walk-behind mower disposed forwardly of the sulky, said mower having a deck with forward and rear

ends and defining an inverted pan-shaped housing, ground engaging mower support wheels disposed on respective axles carried at said forward and rear deck ends, a handle extending rearwardly and upwardly from said mower deck for guiding movement of the mower, a rotary power source with a shaft mounted on said housing, a cutting blade mounted on said shaft within said housing, transmission means connecting the rotary power source to wheels of the sulky so as to rotatably drive the



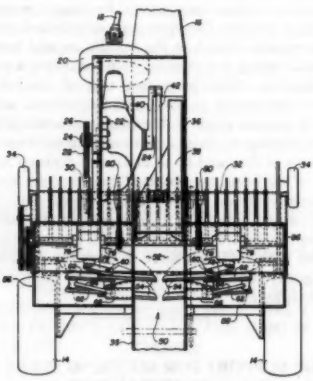
sulky wheels, a bridge support having a central portion bridgingly extending over a rear end of said deck and depending extensions secured to opposite sides of said rear deck end, and means pivotally attaching a forward end of said sulky frame to said central portion of said bridge support whereby forces incurred as an incident propelling the mower are transmitted from the sulky through said bridge and thence to opposed sides of said mower deck.

4,514,968

IN-LINE RECTANGULAR BALER

Kenneth R. Underhill, Strasburg, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Nov. 4, 1982, Ser. No. 439,000
Int. Cl.³ A01P *61/00*
U.S. Cl. 56—341 **4 Claims**



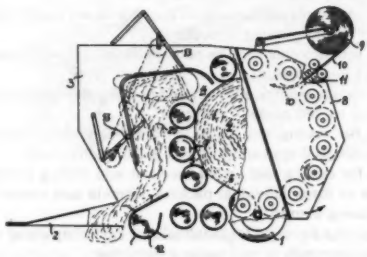
1. A baler comprising:
(a) a subframe;
(b) pickup means supported on said subframe;
(c) a bale case supported on said subframe above and substantially centrally of said pickup means, said bale case having a bottom wall with a feed opening formed therein and side walls;
(d) a plunger reciprocably disposed in said base case for movement back and forth across said feed opening;
(e) a feed case located adjacent to said bale case and being substantially wider than said bale case, said pickup means disposed for delivering crop material to said feed area;
(f) feed means for moving crop material from said feed area upwardly into said bale case through said feed opening;
(g) said feed means including first finger means for moving crop material from one side of said feed area into said bale case and second finger means for moving crop material from the other side of said feed area into said bale case,
(h) said first and second finger means each comprising a pair of fingers, mounted on a shaft, and movable in non-circular loop-like paths through said bale case in timed relationship with the movement of said plunger, the fingers of each said pair of fingers being inclined at an angle with respect to said bottom wall of said bale case; and
(i) said feed area being defined by a bottom panel, side panels, and a back panel, said bottom panel lying below said bottom wall of said bale case, said side panels lying substantially parallel to and outwardly from said side walls of said bale case, said back panel extending upwardly from said bottom panel past said bottom wall of said bale case, and said back panel extending transversely between said side panels.

4,514,969

APPARATUS FOR PRODUCING A WRAPPED CYLINDRICAL BALE OF HARVESTED AGRICULTURAL MATERIAL

Karl Moosbrucker, Sonnenhalde 21, D-7968 Saulgau; Bernd Hollmann, Karl-Peters-Str. 17, D-4800 Bielefeld 1, and Theodor Freye, Am Rowekamp 11, D-4834 Harsewinkel, all of Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,648
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311132
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **9 Claims**



1. A mechanism for rolling and wrapping harvested agricultural material to produce a roll bale of said agricultural material, comprising a roll bale press apparatus adapted to be moved through a field of harvested agricultural material, said apparatus having first means defining a prechamber that is disposed adjacent the forward portion of said apparatus relative to the direction of movement of said apparatus, second means defining a press region that is disposed rearwardly of said prechamber, and means for supplying wrapping material to said press region, means defining a first inlet orifice through which harvested agricultural material may pass from the exterior of said apparatus into said press region, means defining a second inlet orifice through which harvested agricultural material may pass from said prechamber into said press region, said second inlet orifice being located within said apparatus at a position above said first inlet orifice, said apparatus further including a variable position pick-up device operative in a first position thereof to direct harvested agricultural material through said first inlet orifice into said press region and operative in a second position thereof to direct harvested agricultural material into said prechamber, and transport means

within said prechamber for conveying harvested agricultural material in said prechamber upwardly to said second inlet orifice.

4,514,970

RAKE ATTACHMENT

Richard C. Wilson, Champlin, Minn., assignor to Tie Down Engineering, Inc., Atlanta, Ga.

Filed Feb. 9, 1984, Ser. No. 578,485
Int. Cl.³ A01D *7/00*
U.S. Cl. 56—400.12 **10 Claims**

1. A rake attachment for connecting a pair of rakes, each rake having tines and an elongated handle connected at one end to the tines, comprising:

(a) a first handle clamp attachable to one of the rake handles adjacent its free end, and including anti-rotational means for preventing rotation of that rake handle about its longitudinal axis with respect to the clamp;

(b) a second handle clamp attachable to the other rake handle adjacent its free end and including anti-translational means for preventing longitudinal movement of the rake with respect to the clamp but permitting rotation of the rake handle about its longitudinal axis with respect to the clamp; and

(c) hinge means for connecting the handle clamps and permitting the clamps to swing with respect to one another in a common plane about an axis normal to the plane, so that the second rake may be rotated to nest its tines with those of the first rake or may be rotated so as to bring its tines in opposition to those of the first rake, permitting raked material to be gathered between the opposed tines of the rakes.

4,514,971

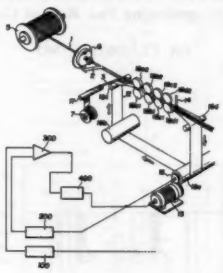
APPARATUS FOR MANUFACTURING SCREENED CABLE

Yasuhiko Mizuo, 29-7, Honta 5-chome, Kokubunji-shi, Tokyo, Japan (185)

Filed Apr. 8, 1983, Ser. No. 483,844
Claims priority, application Japan, May 10, 1982, 57-77887
Int. Cl.³ B21D *13/00*; H01B *13/22, 7/20*
U.S. Cl. 57—9 **3 Claims**

1. In an apparatus for manufacturing a screened cable and of the type wherein a wavily patterned conductive tape is supplied from a supply to a core also supplied from a supply, and including means for longitudinally forming said tape around said core, thereby forming a screened cable, and means for pulling the thus formed cable through the apparatus, thereby imparting tension to said cable, the improvement wherein said forming means comprises at least two pairs of rolls, each said pair of rolls comprising a first roll having a concave peripheral surface shaped for pressing said tape against said core, and a second roll having a concave peripheral surface shaped for deforming opposite edges of said tape over said core, and of means for relieving said tension on said tape during said forming thereof around said core, said tension relieving means comprising:

means for supporting and advancing said tape between said rolls of said forming means during the period of forming thereby of said tape around said core; and



means separate from said pulling means, for moving said supporting and advancing means, and thereby said tape, in the same direction and at the same speed as said cable is moved by said pulling means;

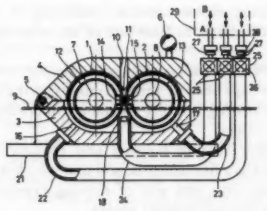
whereby said rolls of said forming means longitudinally form said tape around the circumference of said core in an untensioned state of said tape.

4,514,972

PNEUMATIC CLEANING APPARATUS FOR OPEN END FRICTION SPINNING MACHINES

Fritz Stahlecker, Josef-Neidhart Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, of DEX

Filed Feb. 24, 1984, Ser. No. 583,390
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308247
Int. Cl.³ D01H *7/885*
U.S. Cl. 57—301 **22 Claims**



1. Open end friction spinning apparatus comprising:

a plurality of spinning units having respective friction roller pairs disposed to form yarn forming wedge slots therebetween, and

pneumatic cleaning means for cleaning the friction roller.

4,514,973

MOBILE CLEANING DEVICE FOR OPEN END FRICTION SPINNING MACHINES

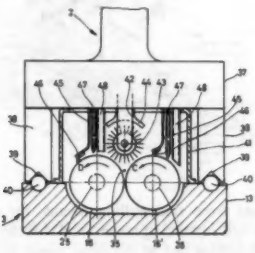
Fritz Stahlecker, Joseph-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, of DEX

Filed Feb. 24, 1984, Ser. No. 583,392

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308248

Int. Cl.³ D01H *7/885*

U.S. Cl. 57—301 **30 Claims**



1. Apparatus for open end friction spinning comprising:

a plurality of adjacently arranged spinning units exhibiting respetive friction roller pairs defining a yarn forming wedge slot therebetween, fiber supply means for supplying fiber to said wedge slot, and roller driving means for drivingly rotating the rollers in the same rotational direction,

mobile servicing unit means including cleaning means for cleaning friction rollers of the spinning units and drive means for selectively moving said mobile servicing unit means to respective servicing positions adjacent spinning units to be cleaned.

4,514,974

OPEN END FRICTION SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, of DEX

Filed Jan. 25, 1984, Ser. No. 573,633

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305621

Int. Cl.³ D01H *1/135, 1/20*

U.S. Cl. 57—401 **32 Claims**

1. Open end friction spinning machine having a plurality of spinning units disposed at a machine frame to be driven by common driving element means extending in the machine longitudinal direction, at least one of the spinning units comprising:

a pair of friction rollers disposed adjacent one another to form a wedge shaped yarn forming slot therebetween,

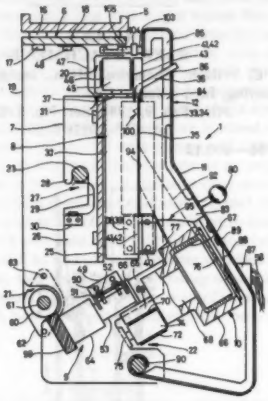
a common bearing housing rotatably supporting the pair of friction rollers,

said common bearing housing and friction rollers being assembled as a first construction unit which is mounted for movement into and out of driving connection with a common driving element means,

fiber inlet and opening means for drawing in and opening fiber material to be fed to the yarn forming slot,

said fiber inlet and opening means being assembled as a second construction unit which is mounted for movement into and out of driving element means, and

a movable intermediate means engageable with both said first and second construction units to force said construction units toward one of their driving and non-driving



positions against the effect of return force adjusting means.

4,514,975

FRICTION ROLLER ARRANGEMENT FOR OPEN END FRICTION SPINNING MACHINE

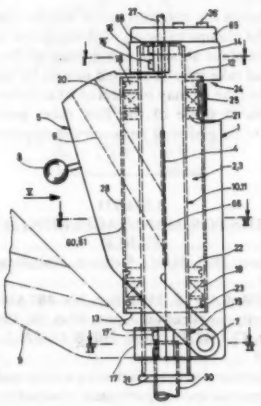
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, of DEX

Filed Jan. 25, 1984, Ser. No. 573,725

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306225

Int. Cl.³ D01H *1/135, 1/20*

U.S. Cl. 57—401 **26 Claims**



1. Apparatus for open end friction spinning comprising:

two friction rollers arranged adjacent to one another to form a yarn forming wedge slot therebetween, said rollers exhibiting respective roller shells;

roller bearing means rotatably supporting the friction rollers adjacent their respective ends, said shells being arranged and supported at the roller bearing means; and

a belt drive means engageable directly at the outer surface of the shells for rotatably driving same during spinning operations.

4,514,976

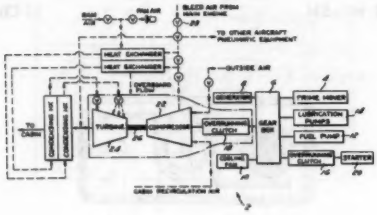
INTEGRATED AUXILIARY POWER AND ENVIRONMENTAL CONTROL UNIT

William J. Christoff, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 155,369, Jun. 2, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,118

Int. Cl.³ F02C *6/08*

U.S. Cl. 60—39.07 **1 Claim**



1. An integrated environmental control and auxiliary power unit for a vehicle having a propulsion engine, said unit comprising:

a prime mover;

a variable geometry compressor including a diffuser having a plurality of controllable variable exit vanes;

means for positioning said variable exit vanes to control the output flow of said compressor;

an overrunning clutch operable to couple said prime mover to drive said compressor;

means for supplying bleed air from said propulsion engine to drive said compressor when said prime mover is not running;

a controlled emission turbine coupled to said compressor by a common drive shaft;

means for blocking a selectable portion of the flow supplied to said turbine to match the flow from said compressor to maintain near constant pressure to said turbine over a wide flow operating range; and

means for independently utilizing the output flow from said compressor and from said turbine.

4,514,977

WATER LIFT SYSTEM

Collin W. Bowen, 1105 Ada St., Durant, Okla. 74701

Continuation-in-part of Ser. No. 303,692, Sep. 21, 1981, abandoned, which is a continuation of Ser. No. 88,955, Oct. 29, 1979, abandoned. This application Dec. 13, 1982, Ser. No. 449,509

Int. Cl.³ F04F *10/00*

U.S. Cl. 60—398 **2 Claims**

1. An apparatus to create a liquid energy head at an elevational B, comprising:

a vacuum fill-tank (VFT) disposed above a liquid supply at elevation A, wherein B is higher than A and no greater that about 30';

a vacuum pump mounted on the top of said VFT;

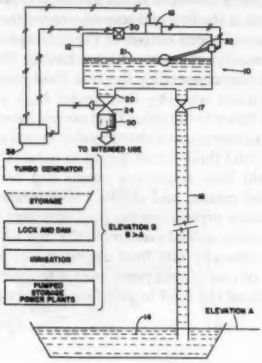
an air intake valve located at the top of said VFT;

an inlet conduit extending from below the level of said lower liquid supply to said vacuum fill-tank;

a unidirectional valve in said conduit to allow flow into said VFT and prevent flow back into the lower liquid supply;

and outlet from said VFT, and a discharge valve means to control the flow of liquid through said outlet;

means to sequentially initiate operation of said system, including means to close said discharge valve and said air intake valve, and initiate said vacuum pump, means to stop said pump upon a given condition in said VFT, means



while said pump is stopped thereafter to open said discharge valve and said air intake valve; and

directing said discharging liquid to a useful purpose.

4,514,978

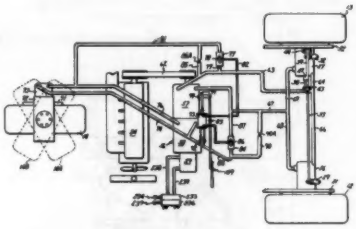
FLUID PRESSURE POWER TRANSMISSION

Floyd E. Buschbom, Long Lake, and Glen D. Hansen, Maple Plain, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

Division of Ser. No. 170,145, Jul. 18, 1980, Pat. No. 4,373,600. This application Sep. 29, 1982, Ser. No. 428,010

Int. Cl.³ F15B *18/00;* **F16H** *39/02, 39/46*

U.S. Cl. 60—426 **10 Claims**



1. A fluid pressure power transmission comprising: fluid operated first motor means, fluid operated second motor means, first pump means for supplying fluid under pressure to the first motor, first fluid circuit means connecting the first pump means to the first motor means, second pump means for supplying fluid under pressure to the second motor means, second fluid circuit means connecting the second pump means with the second motor means, means for concurrently operating the first and second pump means whereby said first and second pump means supply fluid under pressure to the first and second circuit means thereby operating said first and second motor means, said first and second pump means each having control means operable to vary the rate of flow of fluid discharged by the pump means, linkage means connected to the control means of the first and second pump means to concurrently operate the control means of the first and second pump means, means connected to the control means of one pump means operable through said linkage means to actuate the control means of the first and second pump means to vary the output flow of fluid from said first and second pump means, said linkage means including fluid operated means operable in response to a difference in the pressure of the fluid in the first

and second circuits to actuate the control means of the other pump means to alter the rate of flow of fluid discharged by said other pump means so as to substantially balance the pressure of the fluid in the first and second circuits thereby maintaining the torque and speed output of the first and second motor means substantially constant, means having fluid flow restricting means interconnecting the first fluid circuit with the second fluid circuit whereby fluid under high pressure in one fluid circuit flows to the other fluid circuit increasing the pressure of the fluid therein, and shuttle valve means connected to the first and second fluid circuit means in parallel with the means having fluid flow restricting means and connected to the fluid operated means, said shuttle valve means operable to supply fluid under pressure to the fluid operated means when there is a difference in fluid pressure in the first and second fluid circuit means whereby said fluid operated means moves the control means of one of said pump means to substantially balance the pressure of the fluid in said first and second circuits.

4,514,979

HOT-GAS PISTON TYPE ENGINE

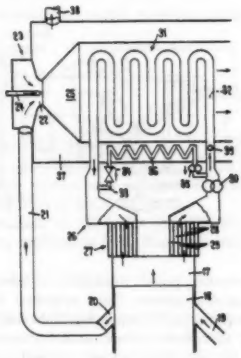
Ernst Mohr, Murten, Switzerland, assignor to Fides Treuhand GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,755

Claims priority, application European Pat. Off., Jan. 27, 1981, 81810022

Int. Cl.³ F01B *29/00*

U.S. Cl. 60—512 **11 Claims**



1. A hot-gas piston type engine comprising a first heat exchanger constructed to act as a compression space of a cylinder of said engine, an intermediate circuit containing an auxiliary medium, and a second heat exchanger cooperating with a heat medium, said first heat exchanger, said intermediate circuit and said second heat exchanger being connected in series whereby heat may be efficiently transferred between said heat medium and said compression space of said cylinder, said first heat exchanger including annular, concentric capillary chambers which, viewed from an underneath disposed cylinder, are alternatively open at the top and at the bottom, the air coming out of the cylinder flowing into the capillary chambers open at the bottom and the auxiliary medium circulated by a circulation pump flowing through the capillary chambers open at the top.

4,514,980

HYDRAULIC RESERVOIR FOR TANDEM MASTER CYLINDER

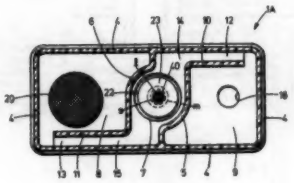
Ichiro Ishiwata, Kanagawa, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Continuation of Ser. No. 191,929, Sep. 29, 1980, abandoned. This application Jan. 3, 1983, Ser. No. 455,243

Claims priority, application Japan, Oct. 22, 1979, 54-146658[U]

Int. Cl.³ B60T *17/22*

U.S. Cl. 60—534 **12 Claims**



1. A hydraulic reservoir for a tandem master cylinder comprising:

(a) a body having an upper wall, a lower wall, first and second side walls disposed opposite each other and joining the upper and lower walls, and third and fourth side walls joining the first and second walls and the upper and lower walls,

(b) two transversely extending partition walls spaced from each other to form a float chamber therebetween, one of said transversely extending partition walls extending from the first side wall toward the second side wall, the end of said one partition wall terminating at a point short of said second side wall, the other of said partition walls extending from said second side wall toward said first side wall with the end of said other partition wall terminating at a point short of said first side wall,

(c) a brake fluid level sensor disposed in said float chamber, said sensor operating to indicate a predetermined brake fluid limit level for said cylinder;

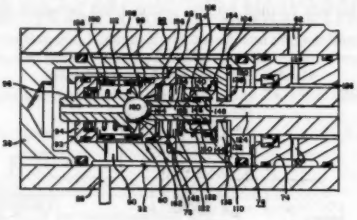
(d) two ancillary walls extending closely to and along said first and second side walls, respectively, a slit-like passage being defined between each ancillary wall and the adjacent side wall, said ancillary walls being joined, respectively, to said ends of said partition walls, one of said ancillary walls extending toward and terminating close to said third side wall, the other ancillary wall extending toward and terminating close to said fourth side wall whereby said slit-like passages terminate, respectively, close to said third and fourth side wall; and

(e) two brake fluid reserving chambers formed within the spaces defined by said partition walls and ancillary walls and the adjacent upper, lower and side walls in said body, said slit-like passages defining bottoms positioned in a plane above the plane of said lower wall, said passages thereby defining open ends communicating with said brake fluid reserving chambers from said bottoms upwardly so that said brake fluid reserving chambers communicate with each other through said slit-like passages and through said float chamber, the plane containing said bottoms being slightly lower than said brake fluid limit level, and said slit-like passages having at least such length that the amount of flow of brake fluid between said two brake fluid reserving chambers is limited to a predetermined value upon the inclination of the brake fluid level relative to said body whereby at least a minimum amount of brake fluid sufficient to brake is secured in each of said reserving chambers upon such inclination.

4,514,981
BRAKE BOOSTER

Arthur K. Brown, South Bend; Keith H. Fulmer, Mishawaka, and Jerome T. Ewald, South Bend, all of Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 7, 1983, Ser. No. 460,725
Int. Cl.³ B60T 13/00
U.S. Cl. 60—547.1 6 Claims



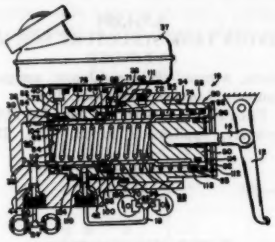
1. A brake booster having a housing with at least one outlet communicating with a brake, a piston movably disposed within the housing to separate a pressure chamber from a work chamber, the piston defining a cavity facing the work chamber, a valve assembly disposed within the cavity and an inlet formed by the housing to communicate fluid pressure to the valve assembly whereby the latter is operable in response to movement of an input assembly to control communication of fluid pressure to the work chamber wherein the fluid pressure biases the piston to move from a rest position to a braking position, the valve assembly including a valve member normally closing fluid communication between the fluid pressure source and the work chamber, the input assembly including an end projection with a passage therein normally communicating the work chamber with a reservoir associated with the brake booster, and the end projection is sealingly engageable with the valve member to close the passage when the valve member is moved by the end projection to communicate the fluid pressure source with the work chamber, characterized in that said end projection comprises a separate part from the remaining portion of said input assembly and said end projection is free to form an angular relationship with said remaining portion to permit said end projection to move angularly relative to said remaining portion when said end projection is forming a sealing engagement with said valve member, said end projection cooperating with said remaining portion of said input assembly to carry a sealing member therebetween, said sealing member sealing said passage from the fluid pressure communicated to the work chamber, the sealing member further biasing said end projection to a coaxial relationship with said remaining portion, the remaining portion terminating in an enlarged head adjacent said end projection for receiving the latter, said enlarged head carrying a collar, a spring engaging said collar to bias the remaining portion to a rest position and the collar cooperating with said end projection to limit the angular relationship between said end projection and remaining portion.

4,514,982
MASTER CYLINDER

Lloyd G. Bach, South Bend, Ind., and Robert F. Gaiser, Stevensville, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 1, 1982, Ser. No. 353,320
Int. Cl.³ B60T 11/20
U.S. Cl. 60—562 7 Claims

1. A master cylinder having a housing with a bore receiving a pair of movable pistons, the pair of pistons cooperating with each other and with the housing to substantially define a pair of pressure chambers, one of the pair of pistons being adapted to connect with an input member which is operable during braking to move the one piston within the housing bore, and a sleeve assembly fixedly disposed within the housing bore includes a pair of sealing means partially defining passages leading to the pair of pressure chambers, respectively, when the other piston is in a rest position, said other piston including means cooperating with said pair of sealing means to substantially define both passages leading to the pair of pressure chambers and movement of said other piston relative to said pair of sealing means simultaneously controls communication through

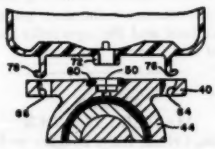


said passages to said pair of pressure chambers, and said other piston cooperating with said sleeve assembly to define at least three sealing interfaces controlling fluid communication between said sleeve assembly and said other piston, two of said sealing interfaces controlling fluid communication to respective pressure chambers and the third sealing interface preventing fluid communication between said chambers.

4,514,983
MASTER CYLINDER ATTACHMENT FOR PLASTIC RESERVOIR

Robert F. Gaiser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 193,764, Oct. 3, 1980, abandoned. This application Oct. 6, 1982, Ser. No. 433,179
Int. Cl.³ B60T 11/20
U.S. Cl. 60—562 3 Claims



1. In a master cylinder assembly having a housing movably supporting a pair of pistons which are movable axially therein, the pair of pistons cooperating with the housing to substantially define a pair of pressure chambers, the housing defining a pair of openings leading radially to the pair of pressure chambers, a plastic reservoir substantially defining a pair of cavities which communicate fluid stored in the plastic reservoir to respective pressure chambers via a pair of ports defined by the plastic reservoir, and sealing means between the plastic reservoir and the housing to substantially prevent leakage from the communication of fluid between the pair of cavities and the pair of pressure chambers, characterized by said plastic reservoir including at least one integrally formed boss extending into one of said housing openings, said one boss cooperating with said housing to substantially define a groove for receiving said sealing means, and said plastic reservoir also including at least one tab extending outwardly in the same direction as said one boss, said one tab releasably engaging said housing to retain said one boss within said one opening and lock said plastic reservoir to said housing in the absence of further parts, thereby maintaining said sealing means in sealing engagement

with said plastic reservoir and said housing, and said one tab cooperating with said housing during attachment of said plastic reservoir to said housing to substantially align said one boss with said one housing opening before said sealing means is engageable with said housing and said plastic reservoir in order to permit the attachment of said plastic reservoir to said housing to proceed in a radial direction to said housing.

4,514,984

RESERVOIR TANK STRUCTURE FOR MASTER CYLINDER

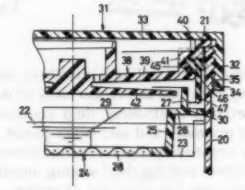
Hitoshi Kubota, Minami-ashigara, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 13, 1983, Ser. No. 503,719

Claims priority, application Japan, Aug. 25, 1982, 57-129016[U]

Int. Cl.³ F15B *7/00*

U.S. Cl. 60—585 **4 Claims**



1. A reservoir tank structure for a master cylinder, comprising:

a reservoir tank comprising an inlet port;

a filter disposed within said reservoir tank, said filter comprising an annular projection which extends upwardly in the direction of said reservoir tank inlet port;

a cap assembly disposed such that it covers said inlet port, and

an oil seal disposed on said cap assembly in resilient engagement with the inner peripheral surface of the reservoir tank to form a seal therebetween, said oil seal being provided with a downwardly extending annular projection which is inserted between the inner peripheral surface of the reservoir tank and the upwardly extending annular projection of said filter.

4,514,985

MASTER CYLINDER

Leonardo Cadeddu, Crema, Italy, assignor to Benditalia S.p.A., Crema, Italy

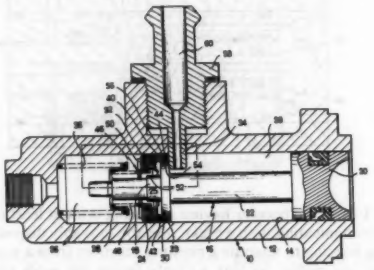
Continuation of Ser. No. 411,389, Aug. 25, 1982, abandoned, and Ser. No. 225,229, Jan. 14, 1981, abandoned. This application Oct. 15, 1984, Ser. No. 661,261

Claims priority, application Italy, Jan. 17, 1980, 19270 A/80

Int. Cl.³ B60T *11/28*

U.S. Cl. 60—589 **1 Claim**

1. A master cylinder comprising a housing provided with a bore, a piston slidably mounted in said bore and having a head limited by a forward radially extending face and a rearward radially extending face with the latter being urged against a stop by a spring to define a rest position for the piston, a stop ring also slidably received in the bore around said piston head and also limited by radially extending forward and rearward faces, and an annular sealing cup made of elastomeric material sliding at its periphery in the bore and separating therein a pressure chamber from a fluid supply chamber, the sealing cup having a radially extending face on the side of the supply chamber and which is urged by a further spring against one of the faces of the stop ring to urge the other face of the stop ring against the stop in the rest position of the piston, the sealing cup radially extending face being engageable by the forward radially extending face of the piston head during its compression stroke, said faces on the piston head and on the stop ring being respectively separated by complementary frusto-conical surfaces whose vertex is located on the axis of the bore on the side of the pressure chamber, said frusto-conical surfaces being separated from each other in the rest position of the piston to allow fluid communication between the pressure chamber and the supply chamber and being mutually intimately engageable during the compression stroke of the piston to cause the piston to move the stop ring toward said pressure chamber with the stop ring acting as a stabilizing guide for the piston, the frusto-conical surface formed on the piston head between its two



faces having a maximum axial height less than that of the complementary frusto-conical surface formed on the stop ring while their respective minimum diameters are substantially equal, so that the respective forward faces of the piston head and stop ring define a continuous coplanar radial surface engaging the entire radially extending face of the sealing cup on the supply chamber side thereof during the compression stroke, the continuous coplanar radial surface applying a substantially constant force across the radially extending face of the sealing cup during the compression stroke in order to reduce deformation and wear of the sealing cup.

4,514,986

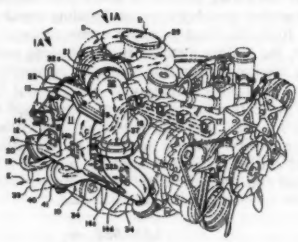
DOUBLE-CHAMBERED EXHAUST MANIFOLD

Steven R. Benson, 1339 W. Main St., Vernal, Utah 84078

Filed Jul. 18, 1983, Ser. No. 514,631

Int. Cl.³ F02B *37/00*; F01N *7/10*

U.S. Cl. 60—605 **8 Claims**



1. A double-chamber exhaust manifold for use with an exhaust gas driven turbine air compressor comprising, an exhaust inlet chamber including spaced apart inlet ports therein; means for connecting said exhaust inlet chamber over and to the exhaust ports of one cylinder head of an internal combustion engine, that is the sole means for mounting the double-chamber exhaust manifold to said internal combustion engine, such that exhaust ports of said cylinder head will align with to vent engine exhaust gases through said inlet ports; connection means for connecting said exhaust inlet chamber to the exhaust gas inlet side of an exhaust gas driven turbine air compressor; said separate exhaust outlet chamber rigidly connected to said

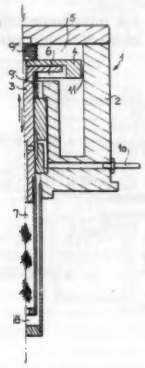
exhaust inlet chamber; connection means for connecting said exhaust outlet chamber to the exhaust gas outlet side of said exhaust gas driven turbine air compressor; and means for coupling said exhaust outlet chamber to a vehicle exhaust system venting an exhaust gas flow thereto.

4,514,987

PASSIVE AUTOMATIC PHASE DELAY CONTROL OF THE DISPLACER MOTION IN PNEUMATICALLY DRIVEN SPLIT CYCLE TYPE CRYOCOOLERS

Nachman Pundak, Kibbutz Eyn Charod, and Shmuel Shtrikman, Rechovot, both of Israel, assignors to Ricor Ltd., Israel

Filed May 17, 1983, Ser. No. 495,429
Claims priority, application Israel, May 25, 1982, 65881
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **6 Claims**



2. A split cycle type cryocooler system comprising an expansion cell and walls forming a pneumatic volume, a displacer located within and dividing the volume into separate chambers in communication within said volume through a constrictive passage, said displacer being displaceable within said volume for varying the volume of said chambers where the volume changes periodically under the phase difference in relation to pressure pulses acting on said expansion cell, to said displacer is attached an electrically conductive body, means incorporated into said pneumatic volume for forming a magnetic field so that said electrically conductive body is located in the magentic field whereby eddy current is created and mechanical drag is produced by the displacement of said displacer.

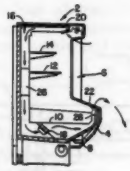
4,514,988

REFRIGERATED DISPLAY CASE HAVING AMBIENT AIR DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Division of Ser. No. 361,798, Mar. 25, 1982, Pat. No. 4,457,139, which is a continuation-in-part of Ser. No. 117,571, Feb. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 60,459, Jul. 25, 1979, Pat. No. 4,295,340, which is a continuation-in-part of Ser. No. 11,804, Feb. 14, 1979, abandoned, and a continuation-in-part of Ser. No. 295,542, Aug. 24, 1981, Pat. No. 4,408,465, and Ser. No. 225,997, Jan. 19, 1981, Pat. No. 4,338,792. This application Nov. 9, 1983, Ser. No. 550,103
Int. Cl.³ F25D *21/12*
U.S. Cl. 62—82 **5 Claims**

1. A method for selectively operating a refrigerated display case in a refrigeration cycle and a defrost cycle, where the case includes top, rear, front and bottom walls with an access opening in the front wall and a single air conduit extending along the top, rear, bottom, and lower front walls, the air conduit having first and second openings at its opposite ends and each of the openings being located on opposite sides of the access opening; the method comprising the steps of: refrigerating air moving through the air conduit during a refrigeration cycle; circulating air within the air conduit in a forward direction through the air conduit during a refrigeration cycle; switching the operation of the display case between the refrigeration cycle and the defrost cycle and correspondingly causing the direction of circulation of air within the air conduit to be reversed; circulating air in a reverse direction during a defrost cycle; drawing in ambient air from outside of said display case



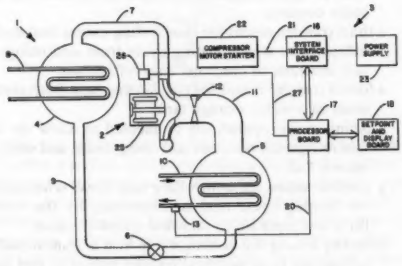
through the first opening when air is circulated within the air conduit in the reverse direction and is circulated upwardly through the lower front wall; and imparting a significant horizontal velocity vector directed away from the case to the air ejected from said air conduit near the top of the lower front wall for causing substantially all air leaving the air conduit during substantially the entire defrost cycle to change from an upward to an outward flow direction so as to flow away from the case; said change in flow direction being at least 20° from the vertical plane of the lower front wall.

4,514,989

METHOD AND CONTROL SYSTEM FOR PROTECTING AN ELECTRIC MOTOR DRIVEN COMPRESSOR IN A REFRIGERATION SYSTEM

Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 610,150
Int. Cl.³ F25D *17/02*; H02H *7/00*
U.S. Cl. 62—201 **8 Claims**



1. A method of operating a refrigeration system having a compressor driven by an electric motor, comprising:

monitoring a load to be satisfied by operation of the refrigeration system;

turning on the refrigeration system, including the refrigeration system compressor, when the step of monitoring detects a load to be satisfied by operation of the refrigeration system;

turning off the refrigeration system compressor when the load is satisfied and the refrigeration system is providing excess capacity for satisfying the load;

sensing current flow to the electric motor driving the refrigeration system compressor when the compressor is turned off due to excess capacity; and

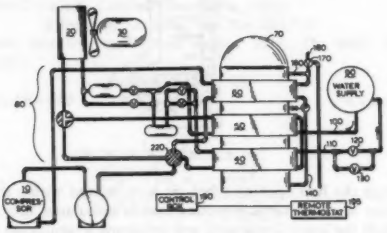
shutting down operation of the refrigeration system if the sensed current flow is abnormal.

4,514,990

HEAT EXCHANGE SYSTEM WITH SPACE HEATING, SPACE COOLING AND HOT WATER GENERATING CYCLES

Alfred Sulkowski, 4 Oak Dr., Marlboro, Conn. 06447

Filed Nov. 9, 1982, Ser. No. 440,370
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.7 **12 Claims**



1. A heat exchange system having a space heating cycle, a space cooling cycle with water heating, and an independent water heating cycle comprising:

a compressor;

a refrigerant adapted to absorb and emit heat by changing from a liquid to a gas and from a gas to a liquid phase respectively circulated by said compressor;

a medium adapted to absorb or emit heat;

a water storage tank;

a first transfer means for transferring heat for space heating from said refrigerant during the heating cycle and for transferring heat to said refrigerant for space cooling during the cooling cycle;

a second transfer means for transferring heat from said medium to said refrigerant during the space heating cycle and independent water heating cycle and for transferring heat to said medium from said refrigerant during said space cooling;

a third transfer means for transferring excess heat during the independent water heating cycle from said refrigerant to said medium; to condense said refrigerant;

a fourth transfer means for transferring heat from said refrigerant to a water storage tank;

a piping means operatively connected to allow the flow of said refrigerant between said compressor, and said transfer means; and

a control means for controlling said flow; whereby during the heating cycle heat is transmitted by the refrigerant form said medium to said first transfer means;

whereby during the cooling cycle heat is transmitted by the refrigerant from said first transfer means to said medium; and

whereby during the independent water heating cycle heat for water heating is transmitted from said medium to said tank.

4,514,991

VARIABLE SPEED DRIVE MOTOR SYSTEM WITH INVERTER CONTROL

Thomas M. Zinsmeyer, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,640
Int. Cl.³ F25B *1/00;* **F16H** *37/06*
U.S. Cl. 62—209 **4 Claims**

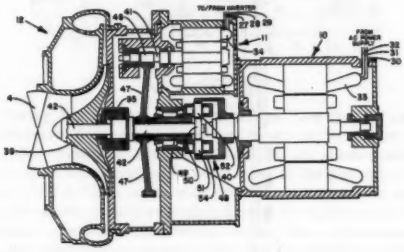
1. A variable speed drive motor system for a centrifugal compressor in a vapor compression refrigeration system comprising:

a main motor means for rotating a main motor drive shaft about its longitudinal axis at a fixed speed;

an AC auxiliary motor/generator means for receiving electrical excitation signals in a selected sequence, each of said excitation signals having a selected frequency and magnitude, and for rotating an auxiliary motor/generator drive shaft about its longitudinal axis at a speed and in a direction which depend on the selected sequencing, frequencies, and magnitudes of the received electrical excitation signals wherein during the upper half of the compressor speed range the AC auxiliary motor/generator means rotates in a first direction and during the lower half of the speed range of the compressor the motor/generator means rotates in the opposite direction;

an output drive shaft for rotating an impeller of the centrifugal compressor when said output drive shaft is rotated about its longitudinal axis;

a transmission means for interconnecting the main motor drive shaft and the auxiiary motor/generator drive shaft



to the output drive shaft to rotate the output drive shaft about its longitudinal axis at a speed which depends on the speed and direction of rotation of the auxiliary motor/-generator drive shaft relative to the speed and direction of rotation of the main motor drive shaft;

an inverter means for receiving electrical power signals and electrical control signals, for processing said received electrical power signals and electrical control signals to form electrical excitation signals each having a selected frequency and magnitude which is determined by the received electrical control signals, and for supplying said electrical excitation signals to the AC auxiliary motor/-generator means in a selected sequence which also is determined by the received electrical control signals;

power supply means for supplying the electrical power signals to the inerter means; and

a control means for monitoring selected operating conditions of the refrigeration system, and for generating electrical control signals in response to the monitored operating conditions, and for supplying these generated electrical control signals to the inverter means to vary the speed of rotation of the output drive shaft in a desired manner.

4,514,992

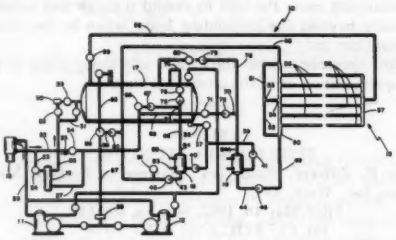
REFRIGERATION SYSTEM FOR ICE RINKS UTILIZING PRESSURE CONTROL/METERING VALVE

Richard B. Holmsten, 2127 Dudley Ave., St. Paul, Minn. 55108

Filed Mar. 19, 1984, Ser. No. 591,220
Int. Cl.³ A63C *19/10*
U.S. Cl. 62—235 **3 Claims**

1. In a refrigeration system for delivering chilled refrigerant substantially entirely in the liquid state to a zone where heat is being extracted and including compressor means having an inlet and an outlet for delivering high pressure refrigerant therefrom, means for delivering said high pressure refrigerant to a first storage vessel wherein said output is received and at

least partially evaporated and maintained at a relatively lower pressure, means for intermittently delivering refrigerant in liquid phase from said first storage vessel to a second storage vessel wherein said delivered refrigerant is received and normally maintained at said relatively lower pressure, first conduit means for providing communication between the upper portions of said first and said second storage vessels, means including said first conduit means for intermittently coupling said second storage vessel substantially directly to said high pressure refrigerant, means for delivering the refrigerant from said



second storage vessel under the influence of said high pressure refrigerant to the zone where heat is being extracted, and means for returning the refrigerant from said zone where heat is being extracted to said first storage vessel, the improvement comprising:

(a) fixed orifice means disposed within said first conduit means immediately adjacent the inlet to said second storage vessel and adapted to provide an expansion zone within said second storage vessel to achieve pressure reduction for high pressure refrigerant flowing therealong from said compressor means to said second storage vessel.

4,514,993

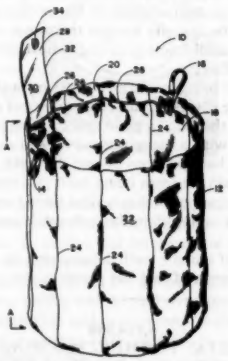
INSULATED BARREL COOLER

Randolph K. Johnson, Bartlesville, Okla., assignor to Idttkow, Inc., Bartlesville, Okla.

Filed Mar. 2, 1984, Ser. No. 585,453

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—372 **3 Claims**



1. A barrel cooler comprising:

(a) an insulated cloth pocketed sleeved member having at least four concentrically sleeved layers further comprising:

(i) a first outer cloth layer;

(ii) an inner layer of cloth insulation;

(iii) a second inner cloth layer attached circumferentially to said first outer cloth layer at the top and at the bottom of said pocketed sleeved member thus confining said inner layer of cloth insulation therebetween;

(iv) a third inner layer of cloth attached circumferentially to said second inner layer and said first outer layer at the bottom of said pocketed sleeved member with the top of said third inner layer of cloth being open; and

(v) a plurality of vertical seams in said sleeved member displaced essentially equal distance around said sleeved member thus creating a plurality of internal open topped pockets between said second and third inner layer of cloth; and

(b) a plurality of plastic bags adapted to hold a freezeable liquid and further adapted to be inserted into said pockets to cool an object placed within said insulated cloth pocketed sleeved member.

4,514,994

APPARATUS FOR AERATING LIQUIDS

Kenneth G. Mabb, Peterborough, England, assignor to Sodastream Limited, Peterborough, England

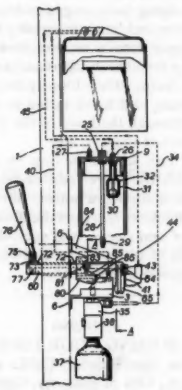
PCT No. PCT/GB82/00116, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/03751, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 21, 1982, Ser. No. 433,209

Claims priority, application United Kingdom, Apr. 27, 1981, 8112942

Int. Cl.³ B67D *5/62*

U.S. Cl. 62—389 **20 Claims**



1. A domestic refrigerator having a cold food compartment defined within a walled cabinet including a door, and a carbonating apparatus mounted within the cold compartment and operable to deliver carbonated liquid to a discharge nozzle, said carbonating apparatus being mounted on the inner side of the refrigerator door and comprising a sealed pressure chamber and a reservoir tank both exposed to the temperature in the cold compartment, valve means to control supply of liquid to the pressure chamber from the reservoir tank and discharge of liquid from the pressure chamber to the nozzle, a gas supply valve for controlling supply of pressurized gas from a gas source to the pressure chamber, an exhaust valve operable to release the gas pressure in the pressure chamber, and a control arrangement for extending through the refrigerator door and coupled to the liquid flow control valve means, said gas supply valve and said exhaust valve for operating the carbonating apparatus manually from outside the refrigerator, the liquid flow control valve means comprising a valve member movable in opposite directions to connect the pressure chamber to the reservoir tank and the discharge nozzle, respectively, the valve member being coupled to the control arrangement to be driven thereby in both said opposite directions, and said discharge

nozzle being mounted to deliver liquid on the outer side of the door.

4,514,995

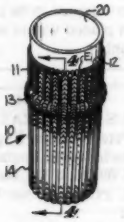
KNIT COVER FOR BEVERAGE CONTAINER

James J. Curtis, and Edward A. Bourgo, both of 6604 N. Mississippi Ave., Portland, Oreg. 97217

Filed Jul. 8, 1983, Ser. No. 512,158

Int. Cl.³ D04B *9/06;* **B65D** *37/00, 65/02*

U.S. Cl. 66—170 **9 Claims**



1. A knit cover for receiving a beverage container comprising a knit sleeve of successive courses knit of yarn having inherent heat insulating properties, and comprising:

an upper tubular knit section having an upper opening;

an outwardly bulging hang engageable annular band encircling said sleeve and being integrally knit with the lower end of said upper tubular section, said outwardly bulging band including held stitch loops and a plurality of courses of outwardly facing stitch loops positioned between said held stitch loops, said band aiding in preventing slipping of the cover through the hand of the holder of a beverage container received therein; and

a lower tubular knit section having an upper portion integrally knit with the lower end of said band, said lower tubular section including a bottom portion having a lower opening of a diameter less than the diameter of the remaining portions of said sleeve, and such that the bottom portion is adapted to underlie the flat bottom of a beverage container received in the sleeve.

4,514,996

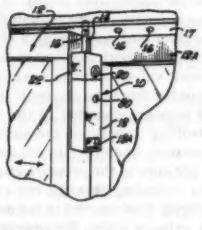
SLIDING DOOR LOCK

C. Norman Sjogren, San Gabriel, Calif., assignor to Belwith International, Ltd., City of Industry, Calif.

Filed Dec. 16, 1983, Ser. No. 562,100

Int. Cl.³ E05B *65/08*

U.S. Cl. 70—100 **6 Claims**



1. A sliding door lock comprising:

a bolt;

a substantially flat, generally rectangular base plate having an upstanding body disposed at one end thereof,

said body including a longitudional guide passsage extending therethrough for guiding the bolt when disposed therein between an open position and a closed position and a rotary barrel lock operable to selectively lock said bolt in a locked position when in the closed position;

a handle which is channel-shaped in transverse cross section and has a pair of inwardly extending flanges disposed one along each of the channel edges to engage the base plate so as to hold the handle thereon in linear longitudinally slidable engagement therewith;

means for fastening said bolt to said handle so that said bolt extends through said guide passage so as to expose the base plate when in the open position and to cover the base plate and cause the bolt to extend through and substantially beyond the upstanding body when in the closed position; and

means operable to hold the handle selectively either in the open position or in the closed position.

4,514,997

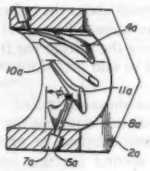
TUBE CORRUGATING DIE

Lothar R. Zifferer, Waco, Tex., assignor to Packless Metal Hose, Inc., Waco, Tex.

Filed May 16, 1983, Ser. No. 494,615

Int. Cl.³ B21C *1/00;* **B21D** *15/04*

U.S. Cl. 72—68 **16 Claims**



1. A metal tube corrugating die for corrugating tubing without a supporting mandrel comprising

a hollow die body with a longitudinally extending bore,

a plurality of die teeth supported in said die body equidistantly around the circumference of and extending into said bore, each having a base portion supported in said die body at an angle to the longitudinal axis thereof,

a corrugating die portion comprising a flat planar plate extending from said base portion having an edge curving from a root portion adjacent to the surface of said bore to a peak portion radially inward therefrom and an arcuate length of a small fraction of one helical coil of the tubing corrugated therein,

each die tooth being uniformly tilted outward at an angle such that the planes of said plates intersect on the longitudinal axis of the die at a point spaced from the intersection of said axis with a plane normal to said axis and passing through the base portions of said die teeth, the angle and spacing of said die teeth being such that multiple uniform helical corrugations in thin walled tubing are produced by passing such tubing therethrough while rotating said die, and

said tilt angle of said die teeth determining the spacing of the innermost points of said flat planar plates.

4,514,998

METAL FORMING MACHINE

Harold R. Jury, 22 Provident Ave., Glynde, Australia

Filed Mar. 8, 1983, Ser. No. 473,224

Claims priority, application Australia, Mar. 9, 1982, PF3019; Sep. 21, 1982, PF5977

Int. Cl.³ B21D *22/10*

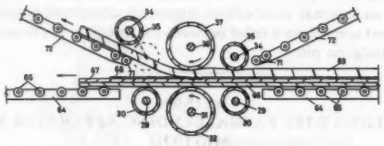
U.S. Cl. 72—184 **8 Claims**

1. A metal forming machine having a frame assembly comprising a fixed frame, an adjustable frame carried by the fixed frame and adjustable with respect thereto, and a pair of sub-

frames each movable with respect to the adjustable frame, a pair of co-operating embossing rollers located one above the other and respectively journalled for rotation in bearings carried by the adjustable frame and the fixed frame,

drive means coupled to both said embossing rollers and arranged to drive the embossing rollers at similar peripheral speeds,

two pairs of co-operating pinch rollers each of which is



parallel to the embossing rollers, the pinch rollers of each pair also being positioned one above the other and respectively journalled for rotation in bearings carried by the sub-frame and the fixed frame, one of the pairs of pinch rollers being on one side of the embossing rollers and the other on the other side thereof,

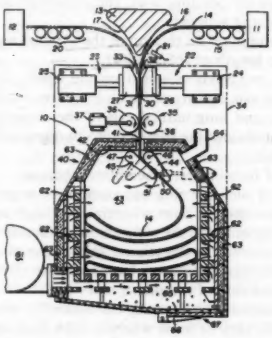
and respective piston/cylinder assemblies coupled between the sub-frames and one of the other said frames being operable to selectively retract the upper pinch rollers.

4,514,999

HEAT RECUPERATOR FOR A STRIP MILL

Donald E. Alvarez, 17256 Akita Ct., Strongsville, Ohio 44136

Filed Oct. 11, 1983, Ser. No. 540,485
Int. Cl.³ B21B *41/00, 45/00*
U.S. Cl. 72—202 **11 Claims**



1. Apparatus for maintaining the temperature of an intermediate product of a strip metal rolling mill, comprising:

oven means to receive the intermediate product from the strip metal rolling mill;

deflector means to direct the intermediate product from the strip metal rolling mill to said oven means;

guide means within said oven means oscillating to positively dispose the intermediate product in a foldedly layered configuration within said oven means, said guide means including co-pendular elements oriented relative to each other on individual pivotal shafts and having opposingly oriented parallel surfaces defining therebetween a region through which the intermediate product may pass; and

pinch roll means for selectively advancing or withdrawing the intermediate product relative to said oven means;

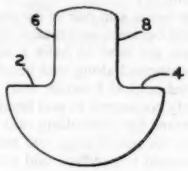
said deflector means further directing the intermediate product from said oven means to the strip metal rolling mill.

4,515,000

METHOD FOR MANUFACTURING CONSUMABLE WELDING SPACER

Roger W. von Ahrens, Colonia, N.J., assignor to Robvon Backing Ring Company, Avenel, N.J.

Filed Sep. 17, 1982, Ser. No. 419,633
Int. Cl.³ B21C *1/00, 3/00*
U.S. Cl. 72—278 **5 Claims**



1. A method for forming a consumable welding insert having a multiple gauge configuration from a continuous length of wire having a Rockwell B hardness rating of from 60 to 80, consisting essentially of the steps of:

achieving an 80% to 90% formation of the final cross-sectional configuration of the insert consisting of the step of cold working said continuous length of metal wire by conducting a single first drawing pass of said wire through a drawing die defining a multiple gauge configuration, and

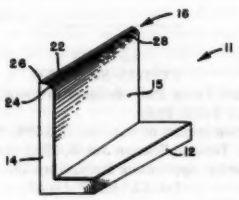
forming said consumable welding insert having its greatest cross-sectional dimension increased over the greatest cross-sectional dimension of said wire including the step of cold working said 80% to 90% formation by conducting at least one further drawing pass of said wire through a drawing die defining a multiple gauge configuration.

4,515,001

VARIABLE RADIUS LEAD FORMER

Robert L. Zahn, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1983, Ser. No. 566,352
Int. Cl.³ B21F *1/00*
U.S. Cl. 72—323 **2 Claims**



1. A variable radius lead former, said former bending opposing axial leads of an electronic component in a staple like fashion, said variable radius lead former comprising:

means for bending said axial leads with a selected radius, said means for bending having a pair of die means for receiving said axial leads, each of said die means having a die, said die having a contact anvil upon which said axial lead is bent; a die platform, said die mounted upon said die platform, said die platform able to move in a horizontal direction parallel to said axial leads in a precisely defined manner whereby a position for starting of a radius bend on said axial leads is determined; and a platform control operatively connected to said die platform, said platform control moving said die platform;

said die including a base, said base mounted to said die plat-

form; a pedestal, said pedestal mounted upon said base; and said contact anvil, said contact anvil mounted to said pedestal;

said contact anvil including a flat horizontal stripe upon which said lead rests while bending occurs and a bending surface shaped like a quartered conical frustum, said lead being bent upon said frustum shaped bending surface, said pedestal having a wall, a top surface of said wall congruent with said bending surface shaped like a quartered conical frustum;

means located between said pair of die means for positioning said component between said means for bending whereby said axial leads are bent to have a selected radius, said leads being positioned along said bending surface shaped like a quartered conical frustum; and

means operatively connected to said bending means and said positioning means for controlling said means for bending and said means for positioning, said means for controlling being programmed to produce said selected radius.

4,515,002

METHOD OF MANUFACTURING SHEAR BLADES FOR SHEARING HOT GLASS

Roland E. Groethe, 640 Lemoyne Ave., Washington, Pa. 15301

Filed Sep. 9, 1983, Ser. No. 530,541
Int. Cl.³ B21D *28/00*
U.S. Cl. 72—339 **7 Claims**

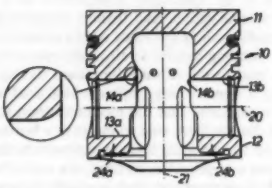
1. The method of making a shear blade for shearing gobs of hot glass without noticeable shear marks, comprising heating a blank of tool steel to a minimum of about 400° F., stamping the desired outline shape of said heated blade by one set of dies followed by forming the blade in its final shape by reheating to said minimum temperature or to about 2150° F. by a second set of dies.

4,515,003

PISTON SHAPING

Ludovico Bruni, Turin, Italy, assignor to Associated Engineering Italy S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 263,688, May 14, 1981, abandoned. This application Jul. 8, 1983, Ser. No. 512,404
Claims priority, application Italy, May 20, 1980, 9440 A/80
Int. Cl.³ B23P *15/10*
U.S. Cl. 72—370 **20 Claims**



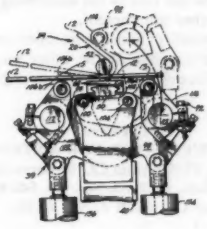
1. A method of shaping gudgeon pin bores formed in respective gudgeon pin bosses of a piston for an internal combustion engine or a compressor, the method comprising, before the insertion of the piston into the engine or compressor, the steps of introducing respective portions of a pin-shaped tool into the gudgeon pin bores and then applying a load to a part of the pin-shaped tool intermediate the gudgeon pin bores, to deform radially outwardly respective areas of bore-defining walls of the gudgeon pin bosses which extend to the inner ends of the bores and which lie on the crown side of a plane which includes the common axis of the gudgeon pin bores and which is normal to the piston axis, whereby, when the piston is inserted into an internal combustion engine or compressor, said deformed areas form a relief between the gudgeon pin bosses and the gudgeon pin.

4,515,004

WELDED WIRE FABRIC BENDING APPARATUS AND METHOD

Howard W. Jaenson, Irwindale, Calif., assignor to Jenglo Engineering, Inc., Azusa, Calif.

Filed Oct. 7, 1982, Ser. No. 433,360
Int. Cl.³ B21D *9/05*
U.S. Cl. 72—388 **2 Claims**



1. Apparatus for bending wire, the apparatus comprising:

(a) an elongated support;

(b) a track mounted on the top of the support and extending along the length of the support;

(c) at least one anvil mounted on the track, such an anvil having an axis and around which a wire is to be bent, the anvil axis and longitudinal axis of the support defining a plane that divides the support into two generally symmetrical halves;

(d) a pair of forming bar assemblies wherein:

(i) the first such forming bar assembly comprises:

(a) a plurality of arms wherein each such arm is pivotally mounted to the support on a first side of the plane and extends to the second side of the plane; and

(b) an elongated forming bar secured to the arms on the second side of the plane; and

(ii) the second such forming bar assembly comprises:

(a) a plurality of arms wherein each such arm is pivotally mounted to the support on the second side of the plane and extends to the first side of the plane; and

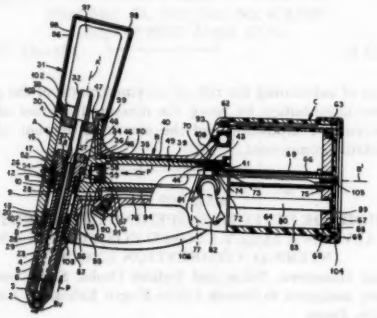
(b) an elongated forming bar secured to the arms on the first side of the plane; *end*

(e) means on the elongated support for pivoting the arms of each forming bar assembly with respect to the anvil to thereby bring such a forming bar into contact with the wire and bend it around the anvil wherein each such forming bar assembly additionally comprises a torque tube for distributing forces provided by the arm pivoting means generally evenly along the length of such a forming bar so that the longitudinal axis of the forming bar remains about parallel to the longitudinal axis of the support when the forming bar is bending the wire around the anvil, wherein each such torque tube extends along the length of the support, is free to rotate about its longitudinal axis, and is connected at each end to a pivot arm of its respective forming bar assembly.

4,515,005
HYDROPNEUMATIC BLIND RIVETER WITH AUTOMATIC MANDREL CATCHER

Günter Klein, Walldorf, Fed. Rep. of Germany, assignor to GESIPA Blindniettechnik Gesellschaft mit beschränkter Haftung, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,288
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112711
Int. Cl.³ B21D *31/00*
U.S. Cl. 72—391 16 Claims



1. A blind riveter comprising:

a housing forming an air chamber and a liquid-filled hydraulic chamber adjacent thereto;

a head on said housing having a tip and forming a liquid—filled working chamber communicating with said hydraulic chamber;

a working piston in said working chamber and carrying a chuck for grasping a mandrel of a blind rivet, said head and chuck forming a passage having a front end opening at said tip and a rear end, said piston being displaceable in said working chamber between a ready position juxtaposed with said tip and wherein a mandrel of a blind rivet can be fitted into said passage at said chuck with said rivet engaged backwardly against said tip and an actuated position spaced from said tip and wherein said chuck is retracted;

a generally closed mandrel-catching compartment on said head, said other end of said passage opening into said compartment;

an air piston in said air chamber;

a hydraulic piston carried on said air piston and displaceable in said hydraulic chamber between an advanced position pressurizing said hydraulic chamber and corresponding to a front position of said air piston and a retracted position corresponding to a rear position of said air piston;

means for pressurizing said air chamber and thereby moving said air and hydraulic pistons into the respective front and advanced positions for pressurizing said working chamber and displacing said chuck from said ready to said actuated position, whereby on displacement of said chuck from said ready to said actuated position the mandrel is pulled off the rivet at said tip;

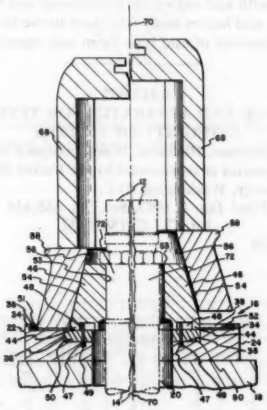
a nozzle directed in said passage toward said other end; and

a valve means connected between said air chamber and said passage for feeding air under pressure from said air chamber to said nozzle after displacement of said chuck from said actuated into said ready position and for thereby simultaneously sucking the pulled-off mandrel from said chuck back along said passage into said compartment, said chuck including an inner mandrel tube extending back toward said other end and having an end forming part of said nozzle, said chuck including an outer mandrel tube spacedly surrounding said inner tube and forming said nozzle therewith, and a spring being braced between said mandrel tubes and urging said inner tube into engagement with said chuck and said outer tube oppositely, said head being provided with a mandrel-tube piston carrying said outer mandrel tube and displaceable therewith toward and away from said tip.

4,515,006
HOSE COUPLING CRIMPER AND METHOD OF CRIMPING

John H. Stanley, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 27, 1983, Ser. No. 461,648
Int. Cl.³ B21D *41/04, 39/00*
U.S. Cl. 72—402 14 Claims



1. A crimping die assembly for radially compressing a sleeve against the exterior of a hose comprising a base plate having an opening for positioning said hose with said sleeve thereon, a die plate mounted on said base plate, said die plate having radial slots, crimping segments slidably mounted in said radial slots for movement into engagement with said sleeve, said die plate being split into two die plate halves, each of said halves being pivotally mounted on said base plate for swinging movement from an open position for positioning said hose and said sleeve to a closed position around said opening in said base plate, a restraining ring member positioned radially outward of said segments to restrain radial outward movement of said segments in said radial slots, said restraining ring member being split into two generally semicircular restraining ring halves, each of said die plate halves having a recess with a shoulder portion in which one of said restraining ring halves is positioned for preventing radial movement, a pressure ring having a tapered bore movable over tapered surfaces of said segments in said closed position of said die plates halves, power means for causing movement of said pressure ring into sliding engagement with tapered surfaces on said segments to move said segments into crimping engagement with said sleeve for compressing said sleeve around said hose and said die plate halves being pivotally movable independently of the movement of said pressure ring into said closed position for gripping said sleeve at a predetermined position by said segments prior to said sliding engagement of said tapered bore on said tapered surfaces of said segments.

13. A method of crimping a sleeve on a hose with a pair of die plate halves containing a plurality of radially movable clamping segments pivotally mounted on a base plate for swinging movement toward and away from a closed position of said segments around an opening in said base plate and with radial movement of said segments being restrained by restraining ring halves positioned in recesses with shoulder portions in

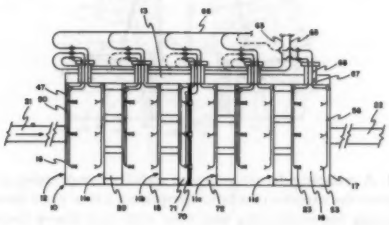
each of said die plate halves to hold said sleeve and hose firmly in position comprising swinging said die plate halves away from said closed position into an open position, positioning said restraining ring halves on said die plate halves within said recesses, positioning a hose in said opening with the sleeve in a predetermined axial position, swinging said die plate halves into said closed position and toward said opening to urge said clamping segments into gripping engagement with said sleeve to retain said sleeve in said predetermined axial position, placing a pressure ring over said segments and depressing said pressure ring in the axial direction causing said segments to move only radially until said sleeve is crimped on said hose after said die plate halves are moved into said closed position and said clamping segments have been urged into gripping engagement with said sleeve, then removing said pressure ring and swinging said halves away from said sleeve in said opening to facilitate removal of said hose from said opening.

4,515,007

METHOD OF AND APPARATUS FOR TESTING THE INTEGRITY OF FILTERS

Raymond L. Herman, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1983, Ser. No. 455,446
Int. Cl.³ G01M *3/20*
U.S. Cl. 73—38 **18 Claims**



1. A method of testing the integrity of a filter mounted in a housing in sealing engagement therewith comprising: passing an airstream in a laminar flow path through said housing and filter, introducing trace agent particles into said airstream upstream of said filter, introducing from a separate source a restricted high velocity airstream in an axial direction within said first mentioned airstream and along said laminar flow path, diffusing said high velocity airstream outwardly in a diverging path into said laminar flow path to create pressure differentials for agitating and uniformly dispersing said particles within said first mentioned airstream to form a homogeneous air-particle mixture passing through said filter, and sampling the filtered airstream downstream of said filter to determine the extent of particle concentration therein.

4,515,008

POLYMERIZATION RATE DETECTION METHOD

Nobuo Matsushita; Tokinobu Furukawa, both of Kudamatsu; Tetsuo Shintani, Hikari; Tomoaki Sumitani, and Chikao Oda, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

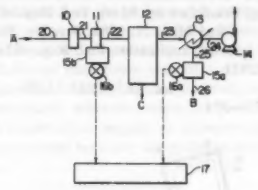
Filed Jun. 10, 1983, Ser. No. 503,349
Claims priority, application Japan, Jun. 16, 1982, 57-102053
Int. Cl.³ G01N *33/44*
U.S. Cl. 73—53 **11 Claims**

1. A process for detecting rate of polymerization, which comprises:

a step of taking out a predetermined amount of a polymer composition from a polymerization reaction process and measuring the amount thereof,

a step of separating the polymer composition thus measured into a volatile component and a non-volatile component,

a step of measuring the amount of the separated volatile component, and



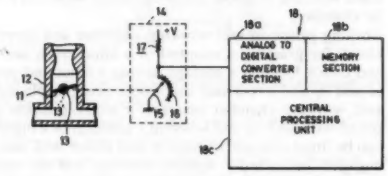
a step of calculating the rate of polymerization of the polymer composition by using the measured amount of the polymer composition and the measured amount of the volatile component.

4,515,009

METHOD FOR DETECTING OPENING OF A THROTTLE VALVE IN A FULLY CLOSED POSITION IN AN INTERNAL COMBUSTION ENGINE

Shumpei Hasegawa, Niiza, and Yutaka Otobe, Shiki, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,605
Claims priority, application Japan, Jan. 14, 1982, 57-4124
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **6 Claims**



1. In a method for detecting the opening of a throttle valve in an internal combustion engine having an intake passage in which said throttle valve is arranged, having the steps of:

(a) constantly detecting the opening of the throttle valve at intervals of time corresponding to the pulse separation of a predetermined timing pulse signal and storing a value thus detected,

(b) comparing said detected value with a value indicative of the opening of the throttle valve previously detected and presently stored, and

(c) storing said detected value as a value indicative of the opening of the throttle valve in a fully closed position, in place of said presently stored value, for use in control of operation of the engine, when it is determined at the step (b) that said detected value is smaller than said presently stored value;

the improvement comprising:

(d) setting said presently stored value to a predetermined initial value upon occurrence of a predetermined event associated with the start of the engine;

(e) repetitively determining whether or not said detected value has kept the same value for a substantial period of time which is sufficient for measuring the opening of the throttle valve in a fully closed position without being affected by noises or other disturbances; and

(f) in the step (c), storing said detected value in place of said presently stored value, only when it is determined at the step (e) that said detected value has kept the same value for said substantial period of time,

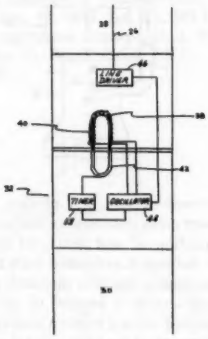
said predetermined timing pulse signal comprising a pulse signal each pulse of which is generated at each of one or more predetermined rotational positions of the engine.

4,515,010

STUCK POINT INDICATING DEVICE WITH LINEAR SENSING MEANS

Vincent C. Weido, and David Grissom, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,980
Int. Cl.³ E21B *31/00, 47/00*
U.S. Cl. 73—151 **10 Claims**



7. A method of determining the point at which a pipe is stuck in a borehole traversing an earth formation comprising:

positioning a movement-sensing means in said pipe at two vertically spaced points at the depth to be tested; subjecting said pipe above said sensing means to a change in stress capable of deforming the pipe between said spaced points, said change in stress being indicated by a change in inductance indicative of said deformation; converting said change in inductance into a frequency modulated signal; converting said frequency modulated signal into a substantially linear voltage capable of quantitative display wherein said display is indicative of deformation between said points in response to said change in stress; and, displaying said linear voltage on the earth's surface.

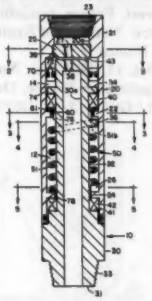
4,515,011

TORQUE TRANSMITTING AND INDICATING DEVICE FOR WELL DRILLING APPARATUS

Herbert W. Beimgraben, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed May 6, 1983, Ser. No. 492,188
Int. Cl.³ E21B *47/00*; G01L *3/14*
U.S. Cl. 73—151 **13 Claims**

1. A downhole apparatus responsive to the torque transmitted by a rotating power source to a drill bit in drilling tool, the apparatus comprising: an annular housing; a mandrel having one end thereof telescopingly mounted with respect to one end of said annular housing, said housing and said mandrel being disposed between, and each keyed to one of, the rotating power source and a portion of the drilling tool; resilient means opposing relative rotation of said annular housing and said mandrel, and thereby between the rotating power source and the portion of the drilling tool, annular flexure of the resilient means producing angular displacement between said housing and said mandrel as a function of torque transmitted from the rotating power source by said resilient means; and means responsive to angular displacement between said mandrel and



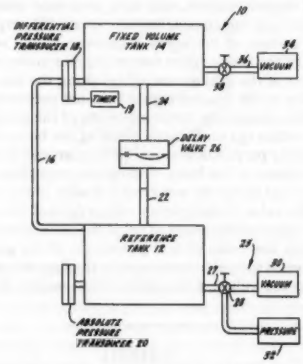
said housing producing a fluid pressure signal for gauging the torque transmitted by the power source.

4,515,012

VALVE TESTING SYSTEM UTILIZING AN ARTIFICIAL ATMOSPHERE

Patrick A. Jenkins, Decatur, and Donald A. Ferguson, Dixon, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 25, 1983, Ser. No. 555,091
Int. Cl.³ G01M *19/00*
U.S. Cl. 73—168 **10 Claims**



1. A test stand assembly for testing a delay valve, comprising:

a first means enclosing a first fluid at a reference pressure;

a second means defining a known volume and enclosing a second fluid;

a pressure transducer connected between the first means and the second means;

a delay valve, connected in parallel with the pressure transducer between the first means and the second means for the testing of said valve; and

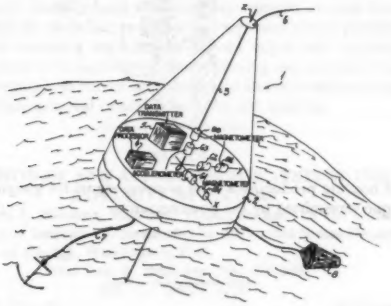
first valve means, connected to the second means, for regulating the pressure of the second fluid, thus adjusting the pressure difference across the delay valve under test.

4,515,013

APPARATUS FOR MEASURING THE VERTICAL ACCELERATION DUE TO THE SWELL

Jean-Pierre Hue, Brest, France, assignor to 501 Etablissement Public dit "Centre National d'Exploitation des Oceans" (CNEXO), Paris, France

Filed Oct. 11, 1983, Ser. No. 540,794
Claims priority, application France, Oct. 14, 1982, 82 17584
Int. Cl.³ G01P *15/00*; G01M *10/00*
U.S. Cl. 73—170 A **5 Claims**



1. Apparatus with accelerometers and magnetometers for measuring the surface characteristics of a sea swell, said apparatus comprising a floating buoy having a main plane which follows the free surface of the water, first accelerometer means mounted on the buoy and oriented along an axis which is perpendicular to the main plane of the buoy, a pair of mutually perpendicular accelerometer means mounted in the main plane, and three magnetometer means, one of said magnetometer being mounted along and coincident with individually associated ones of each of the three axes of the accelerometers, data processor means coupled to be driven by said accelerometers and magnetometers, said data processor means including means for deriving an acceleration vector (h) perpendicular to the free surface of the water responsive to the swell, finding the sum of the acceleration vector (h) due to the swell and the projection of the gravity vector (g) along the axis of the buoy responsive to the accelerometer oriented perpendicular to the main plane, measuring the components of the projection of the gravity vector (g) in the main plane of the buoy responsive to the mutually perpendicular pair of accelerometers mounted on the main plane of the buoy, finding the projection of the gravity vector (g) along the axis perpendicular of the buoy responsive to the value of the gravity vector (g) and the values of the gravity vector components of (g) in the main plane of the buoy, and giving the value of said projection of the gravity vector responsive to the value measured by the first accelerometer for obtaining the value of the acceleration vector (h) due to the swell.

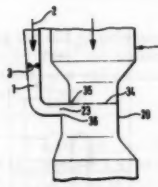
4,515,014

APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

Jaihind S. Sumal, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 395,876, Jul. 7, 1982, Pat. No. 4,468,957. This application Apr. 20, 1984, Ser. No. 602,567
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130626
Int. Cl.³ G01F *5/00*
U.S. Cl. 73—202 **3 Claims**

1. In an apparatus for measuring the mass of a flowing medium, which includes a flow conduit for the medium which has a restricted section, a bypass line which has a mouth connected to said restricted section and through which a proportionate mass of the medium flows which is at a predetermined proportion with respect to a mass of the medium flowing through the flow conduit and said proportionate mass of the medium discharges from said mouth into said restricted section, at least one temperature-dependent resistor disposed in the bypass line, and a regulating means for regulating the temperature and/or resistance of the at least one temperature-dependent resistor, in accordance with the flowing mass of medium wherein a control variable of the at least one temperature-dependent resistor, is a standard for the flowing mass of medium, the improvement wherein said restricted section includes first and second portions of said flow conduit for said medium with said second



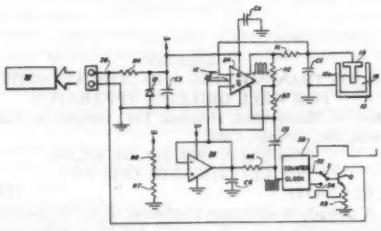
portion downstream of said first portion, said first portion having a narrower cross section than said second portion such that said first portion of said restricted section of the flow conduit for the medium is embodied such that the flow cross section of the medium in the flow direction in said first portion of said restricted section is smaller up to the mouth of the bypass line than said second portion and said second portion beginning at the mouth of the bypass line is wider than said first portion by an amount which corresponds to the bypass line cross section at the mouth of said bypass, and wherein the medium flow conduit is embodied such that said second portion downstream of said first portion forms a stepped widening of the flow cross section.

4,515,015

CAPACITANCE LEVEL SENSOR FOR USE WITH VISCOUS, ELECTRICALLY CONDUCTIVE MATERIALS

George A. Kuhlman, St. Charles, Ill., assignor to Magnetrol International, Incorporated, Downers Grove, Ill.

Filed Feb. 16, 1983, Ser. No. 466,932
Int. Cl.³ G01F *23/26*; G01R *27/26*
U.S. Cl. 73—304 C **12 Claims**



1. A level sensor for developing an output signal indicative of the level of a viscous electrically conductive material in a tank, the material having an electrical impedance including a resistive component, comprising:

a variable capacitor having first and second electrodes, the capacitance between the electrodes being a function of material level height in the tank;

a charging resistor coupled to the variable capacitor having a resistance which is selected to be substantially less than

the resistive component of the material between the first and second electrodes; and

an oscillator which includes the charging resistor and the variable capacitor for developing an output signal having a period which is dependent upon the resistive component of the material between the first and second electrodes, the resistance of the charging resistor and the capacitance of the variable capacitor so that the output signal period is substantially independent of build up of material on the variable capacitor.

4,515,016

ELASTIC SURFACE WAVE ACCELEROMETERS

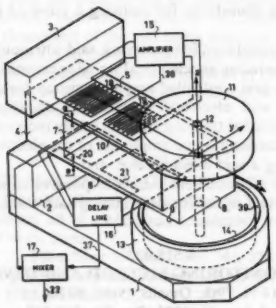
Pierre Hartemann; Paul-Louis Meunier, and Alain Jacobelli, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 17, 1983, Ser. No. 505,174

Claims priority, application France, Jul. 2, 1982, 82 11657

Int. Cl.³ G01P *15/08, 15/13*

U.S. Cl. 73—517 R **14 Claims**



1. An elastic surface wave accelerometer comprising a deformable structure, whereof one end is fixed and whereof the other end is provided with a seismic mass, said structure having two parallel measuring faces with a plane of symmetry perpendicular to the sensitive axis of the accelerometer, each of the said measuring faces have an area occupied by an elastic surface wave means, which detects the bending stresses produced by the component along said sensitive axis of the acceleration to be measured and which acts on the tuning frequency of an oscillator, said oscillator and its homologue being connected to a subtractive mixer, which produces a measuring signal, whose frequency represents the measurement of said component, wherein the said deformable structure has on either side of the said plane of symmetry, two lamelliform flexible elements surrounding a central recess extending from the fixed end to the seismic mass, said measuring faces being constituted by the surfaces of the elements equidistant of the said plane of symmetry and each lamelliform flexible element having a part widened towards the fixture which satisfies the condition of equal bending resistance.

4,515,017

OSCILLATING ULTRASOUND SCANHEAD

Robert F. McConaghy, Kirkland, Wash., assignor to Advanced Technology Laboratories, Inc., Bellevue, Wash.

Filed Nov. 21, 1983, Ser. No. 553,716

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—618 **8 Claims**

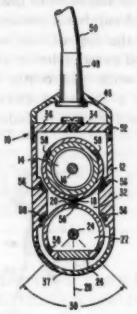
1. An oscillating ultrasound scanhead comprising:

(a) a housing;

(b) a reversible electric motor mounted in said housing, the shaft of said motor being fixedly mounted to said housing:

(c) an ultrasound transducer mounted on a rotor, said rotor being rotatably mounted on a rotor shaft which is substantially parallel to said motor shaft, whereby said rotor can rotate at least through an angle corresponding to the scan angle of said oscillating ultrasound scanhead;

(d) means for driving said rotor by said motor; and



(e) repulsion and energy storage means comprised of fixed magnets mounted in said housing and rotating magnets mounted on said motor and rotor, whereby said magnets are arranged to repel one another at the ends of said scan angle due to the magnetic fields generated therebetween.

4,515,018

GUIDE RAIL APPARATUS FOR AN OBJECT RUNNING AROUND PIPING

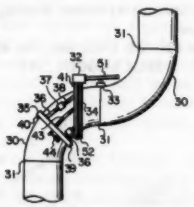
Sigeru Kajiyama, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,159

Claims priority, application Japan, May 13, 1981, 56-70802; Aug. 7, 1981, 56-122960

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—637 **4 Claims**



1. A guide rail apparatus for guiding a running body along an outer peripheral surface of a piping, the apparatus comprising a guide rail including two segments adapted to fit around said piping; a holder including two segments fitting around said piping, said holder being spaced in an axial direction from said guide rail, openable ends of said segments of said guide rail and said holder are located at the same side as said piping; and a rigid connector means for integrally connecting said guide rail and said holder to each other.

4,515,019

PRESSURE MEASURING DEVICE FOR BOTTLES

Ronald C. Woodfill, 4124 Shady Grove, Toledo, Ohio 43623

Filed Mar. 14, 1983, Ser. No. 475,295

Int. Cl.³ G01L *19/00*

U.S. Cl. 73—756 **1 Claim**

1. A cap for an enclosed bottle with an opening, said device incorporating pressure measuring capabilities, comprising:

(a) a bottle cap member with a vertically depending shaft, with such shaft having a vertically aligned central longitu-

dinal axis, such shaft adapted to fit downwardly into the opening of the bottle, said cap member having a hollow chamber therein extending completely through the cap from the bottom of the shaft to the upper extreme of said cap, whereby said cap has a continuous chamber open at the bottom and the top of said cap, said cap member having a threaded exterior lower circumferential surface for engagement with said bottle opening, said hollow chamber having a threaded circumferential extending surface to receive a mating threaded surface;

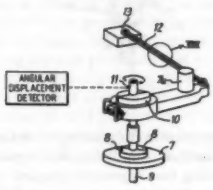
(b) a pressure measuring gauge which has a downwardly depending stem with an open chamber therein, said stem being affixed concentrically in the upper part of the continuous chamber in said cap, such that said stem communicates directly with the hollow chamber of said cap member, said stem having a circumferentially extending surface which is threaded so as to securely engage the interior portions of the bottle cap member.

4,515,020

METHOD AND APPARATUS FOR ENSURING CORRECT THREAD MAKE-UP OF A PIPEJOINT

Bernard Plaquin, Aulnoye Aymeries, France, assignor to Vallourec, Paris, France

Filed Feb. 23, 1983, Ser. No. 469,173
Int. Cl.³ G01N *5/00*
U.S. Cl. 73—761 **6 Claims**



1. A method for ensuring correct tightening of the two members of a threaded pipe joint having at least one torque limiting shoulder, comprising the steps of:

applying a torque to one of said members relative to the other;

measuring continuously said torque and providing a signal indicative thereof;

providing a signal indicative of time;

providing a signal representative of the instantaneous torque gradient of the torque-time curve;

providing a signal representative of the rate of change of said gradient of said torque-time curve; and

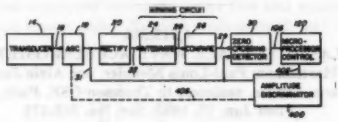
comparing with a predetermined value the maximum value of said signal representative of the rate of change of said gradient in order to ensure that said maximum value exceeds said predetermined value.

4,515,021

INTERVALOMETER TIME MEASUREMENT APPARATUS AND METHOD

David R. Wallace, Milton; James M. Korba, Woburn; James E. Matson, Brookline, and Lawrence C. Lynnworth, Waltham, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Filed Jul. 29, 1983, Ser. No. 518,738
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.27 **28 Claims**



1. An intervalometer for determining the transit time of ultrasonic energy traversing a fluid medium, said intervalometer comprising

a transmitting transducer for emitting a pulse of ultrasonic energy,

a receiving transducer for receiving said ultrasonic energy and for generating ancelectrical signal in response thereto,

an automatic gain controlled amplifier circuit for amplitude stabilizing said electrical signal, said amplifier circuit having means for tracking both a rapidly increasing and a rapidly decreasing signal amplitude of the electrical signal representing a said energy pulse, and

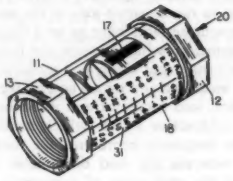
a transit time measurement means responsive to said stabilized electrical signal for determining said transit time.

4,515,022

FLOW MONITORING METHOD AND DEVICE

Glen Brand, 4114 N. 79th, Omaha, Nebr. 68134

Filed Jun. 10, 1983, Ser. No. 502,917
Int. Cl.³ G01F *1/10*
U.S. Cl. 73—861.79 **11 Claims**



1. A flow monitoring device in combination with a hydraulic pump or motor, comprising:

a housing having an inlet end, an outlet end and a transparent wall portion;

means for supporting an axle within said housing;

an axle affixed at one end to the supporting means and located centrally and longitudinally with respect to the two ends of the housing; and

a turbine mounted for rotation about said axle, having a mark thereupon visible through the transparent wall portion of the housing.

4,515,023

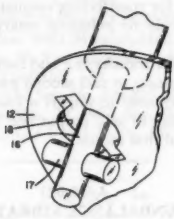
RECREATIONAL POOL IMPLEMENT

Daniel E. Kershner, 1609 Woodside Ave., Baltimore, Md. 21227

Filed Mar. 24, 1983, Ser. No. 478,351
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—864.51 **3 Claims**

3. A lid lifter and a combined water sampling device for a swimming pool comprising an elongated stick having one end

provided with a reduced cross-sectional area, a prong carried by the reduced cross-sectional area and extending transversely therefrom from at least one side of the reduced cross-sectional area, whereby the prong may be inserted beneath the removable lid of a swimming pool skimmer to lift the lid, a rectangular cross-sectioned sampling vial open at one end and closed at



the other end, the stick having an intermediate portion with a complementary transverse recess formed therein to receive the vial, the closed end of the vial being disposed towards the one end of the stick, and the open end of the vial extending laterally beyond both adjacent respective surfaces of the stick, whereby the stick may be inserted into the pool and lifted out to obtain a water sample in the vial.

4,515,024

CLUTCH MECHANISM OF A PUSH-BUTTON TUNER

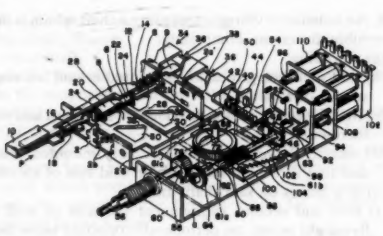
Takeshi Kataoka; Ryoichi Aoki; Hisashi Matsui, and Hiroshi Matsumoto, all of Ueda, Japan, assignors to Ono Seiko Co., Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,987

Claims priority, application Japan, May 19, 1981, 56-74295; May 19, 1981, 56-71370[U]

Int. Cl.³ H03J *5/12*

U.S. Cl. 74—10.33 **4 Claims**



1. In a push-button tuner for use with a tape recorder and which has flat cam plates provided with cam portions in holes therein and which are horizontally slidable through holes in side walls of the tuner, and a push button assembly slidably arranged between front and rear walls and which has a channeling plate pivotably mounted thereon, a clutch mechanism having a clutch plate having a cam therein and slidable lengthwise parallel with the cam plates against the action of a coil spring by the action of the push-button assembly on the cam, a main manual shaft and a follower shaft connected for rotation together, the end of the main manual shaft being rotatably held in the end of the clutch plate for lateral movement, a worm gear on said main manual shaft, and a core support plate slidable for moving cores into and out of coils in accordance with the movement of the core supporting plate; an improved gear wheel clutch and transmission means connected between said cam plates, said worm wheel and said core support plate and comprising: an annular gear wheel having an annular projection projecting radially into the center of said annular gear wheel; a rotation head positioned within said annular gear wheel and mounted on said tuner for rotation within said annular gear wheel and having a laterally outwardly opening groove therearound substantially complementary in shape to said annnular projection, said head having a diameter for having the surfaces defining said groove spaced slightly from the surfaces defining said projection when said head is centered in said annular gear wheel, said annular gear wheel being in mesh with said worm gear and being movable laterally of said head upon lateral movement of said main manual shaft for bringing said projection into frictional driving engagement with said groove; a pair of feet projecting from the lower side of said head and engaged with said cam plates for transmitting movement between said cam plates and said head; and an arm projecting laterally from said head and connected to said core support plate for moving said core support plate in response to movement of said head.

4,515,025

APPARATUS FOR DRIVING TAKE-UP ELEMENTS FOR PALLETIZABLE LOAD UNITS

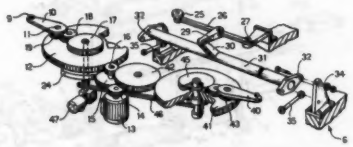
Bruno Missio, Moncalieri, and Angelo Giorgioni, Turin, both of Italy, assignors to Girogioni di A. Giorgioni & C. s.a.s., Turin, Italy

Filed Sep. 9, 1982, Ser. No. 416,423

Claims priority, application Italy, Sep. 28, 1981, 68248 A/81

Int. Cl.³ F16H *21/16;* B65G *25/04*

U.S. Cl. 74—27 **2 Claims**



1. In an installation for handling palletizable load units with take-up elements adapted to carry out cycles of movement each comprising at least a first horizontal movement, a vertical movement, and a second horizontal movement in an opposite direction to said first movement, apparatus for driving the take-up elements which includes a motor; guide means for the horizontal movement of said take-up elements; a mechanical transmission connected between said motor and said take-up elements for driving the horizontal movements thereof, and means for driving the vertical movement, wherein the improvements consist in:

said mechanical transmission between the motor and the take-up elements being constituted by a linkage including gear means defining a crank mechanism driven by the motor and a connecting rod of substantially the same length as the crank mechanism, which is articulated at one end to the crank mechanism and at the other end to a part moveable with the take-up elements, and

said means for driving the vertical movement of the take-up elements comprise cam means driven by the motor and arranged to operate close to the end of the first horizontal movement to cause a continuous variation in the velocity and acceleration of said take-up elements during the vertical movement,

whereby the operation of said motor drives said three movements in succession without intermediate stoppages and with a continuous and substantially harmonic variation in the velocity and acceleration of said take-up elements, and

wherein said crank mechanism is constituted by a first gear wheel; a pinion driven by said motor meshes with said first gear wheel; a second gear wheel is carried by said end of the connecting rod articulated to said crank mechanism; a third gear wheel coaxial with said first gear wheel; an auxiliary gear wheel freely rotatable on the said first gear wheel is interposed between said third gear wheel and said second gear wheel, the latter having a diameter of half the diameter of said third gear wheel, and an auxiliary motor

is provided for rotating said third gear wheel through a limited angle;

said apparatus further including an auxiliary connecting rod articulated to said first gear wheel at a symmectrical point diametrically opposite the point of articulation of the said connecting rod; a pair of coupling elements provided on the take-up elements and spaced from each other in the direction of horizontal movement of the take-up elements, each coupling element being selectively engageable with the free end of a respective said connecting rod; a fourth gear wheel fixed to the end of the auxiliary connecting rod articulated to the first gear wheel and having a diameter equal to that of said second gear wheel, and a further auxiliary gear wheel interposed between said third and fourth gear wheels.

4,515,026

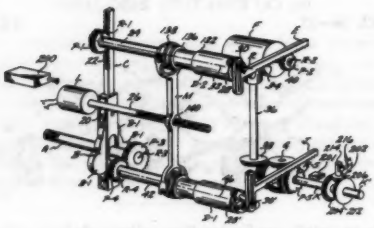
TRANSMISSION

Frank M. Perkins, 257 Avenida Atezsda, Redondo Beach, Calif. 90277

Filed Feb. 16, 1983, Ser. No. 467,140

Int. Cl.³ F16H *35/02*

U.S. Cl. 74—63 **8 Claims**



1. A mechanical transmission that has an input and output shaft and a variable speed ratio, said transmission including:

a. a differential that includes a spider secured to said output shaft, a pair of idler gears rotatably supported on said spider, and first and second gears rotatably supported on said output shaft and in toothed engagement with said idler gears;

b. first and second mechanisms that include rotatable first and second crank arms, and first and second crank pins on said first and second arms that may move longitudinally thereon to have their radii varied, said first mechanism including a first shaft rotatably supported therein that has first and second ends, said first crank arm secured to said first end, said second mechanism including a second shaft rotatably supported therein that has first and second ends, said second crank arm secured to said first end of said second shaft;

c. first means for concurrently varying the radii of said crank pins;

d. second means that include first and second gears that are in toothed engagement and secured to said input shaft and said first shaft for transferring rotary motion from said input shaft to said first mechanism to rotate said first crank arm;

e. third means for transforming rotary motion of said first crank pin to rotary oscillating motion of said first gear of said differential;

f. fourth means for transforming rotary motion of said input shaft to oscillating rotary motion of said second crank arm said fourth means including:

1. a cam rigidly secured to said input shaft, said cam including at least one lobe;

2. a follower in contact with said cam;

3. a toothed first rack that supports said follower, said first rack having linear oscillating motion imparted thereto as said cam rotates;

4. a third gear secured to said second shaft, said third gear in engagement with said toothed first rack, and said third gear, second shaft, and secured crank arm having rotary oscillating motion imparted thereto as said first rack oscillates;

g. fifth means for transferring oscillating rotary motion of said second pin to pulsating rotary motion in a single direction;

h. sixth means for transferring said oscillating rotary motion of said fifth means to said second gear of said differential, for said differential to impart a fixed ratio of output to input velocities of said output and input shafts for each setting of said first means.

4,515,027

UNBALANCE VIBRATOR

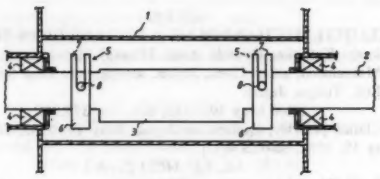
Heinz Baier, Willich; Hans W. Kürten, Ratingen, and Hans-Georg Waschulewski, Mettmann, all of Fed. Rep. of Germany, assignors to Losenhausen Machinenbau AG, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,951

Claims priority, application European Pat. Off., Jan. 29, 1982, 82710002.5

Int. Cl.³ F16H *33/08*

U.S. Cl. 74—87 **6 Claims**



1. An unbalance vibrator including a shaft which is driven in reversible directions, comprising:

(a) a housing

(b) said shaft being rotatably mounted in said housing about an axis of rotation,

(c) first flyweight means provided on said shaft and rotatable therewith,

(d) second flyweight means rotatably mounted relative to said first flyweight means about said axis of rotation,

(e) dog means on said shaft, and

(f) first and second engagement surfaces of said second flyweight means on peripherally opposite sides therof,

(g) said dog means being arranged to engage said first engagement surface in a first operative position of said flyweight means when said shaft is driven in one direction and to engage said second engagement surface in a second operative position of said flyweight means when said shaft is driven in the opposite direction,

(h) said first and second flyweight means having a relatively large resultant unbalance when in said first operative position, and having a relatively small resultant unbalance when in said second operative position,

(i) a locking member arranged for rotation which said shaft and radially movable between a locking position and a releasing position,

(j) said locking member being arranged to engage said second engagement surface when said locking member is in said locking position and said flyweight means are in their first operative position, and to engage said first engagement surface when said locking member is in said locking position and said flyweight means are in their second operative position, and to release said second flyweight means when said locking member is in its releasing position,

(k) spring means for urging said locking member towards its releasing position, whereby, in operation, said locking member is held in its releasing position at relatively low rotary speeds and is moved into its locking position when a predetermined rotary speed of said shaft is exceeded.

4,515,028

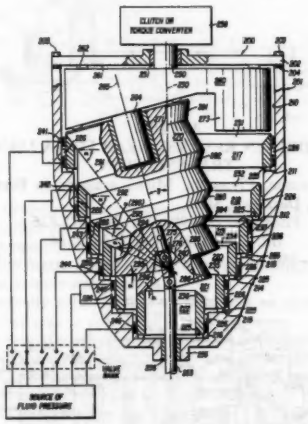
MULTI-SPEED DRIVE

Roy E. VanDerLinden, West Minster, Md., and John H. Francis, Charles Town, W. Va., assignors to Frederick Manufacturing Company, Frederick, Md.

Continuation-in-part of Ser. No. 426,875, Sep. 29, 1982,. This application Mar. 29, 1983, Ser. No. 480,144

Int. Cl.³ F16H *15/00, 15/16*

U.S. Cl. 74—191 **10 Claims**



1. A multi-speed drive comprising:

a supporting frame;

an input shaft;

means for mounting the input shaft for rotation with respect to the supporting frame about a first axis;

a plurality of first members disposed about the first axis, the first members having conical surfaces thereon of different slopes with respect to the first axis, wherein the conical surfaces have apexes which are coincident at a single point, which point is coincident with the first axis;

means for mounting the first members for rotation with respect to the frame;

means for selectively stopping the first members individually;

a second member having a plurality of second conical surfaces in individual engagement with the plurality of first conical surfaces along lines of contact, said second conical surfaces having apexes which are coincident with the apexes of the first conical surface;

means for mounting the second member for rotation about a second axis which is oblique with respect to the first axis said second axis being coincident with the apexes of the first and second conical surfaces and with the first axis;

means for connecting the mounting means to the input shaft to rotate the mounting means about the first axis in a first direction, wherein the second conical surfaces revolve around the first axis as the second member rotates about the second axis, wherein one of the second conical surfaces rolls on whichever of the first members is stopped with respect to the frame with progressive line contact with respect thereto and without sliding motion with respect thereto;

an output shaft mounted for rotation in the frame, the output shaft being in alignment with the first axis;

a coupling having first and second ends, the first end being connected to the output shaft, and the second end being connected to the second member at a location in juxtaposition with the apexes of the conical surfaces thereon;

whereby,

the second shaft has an output torque, speed and direction which is determined by whichever of the first members is stopped with respect to the frame by the stopping means.

4,515,029

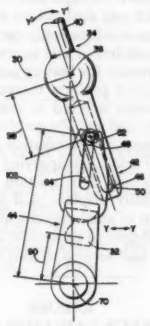
COMPOUND VARIABLE MECHANICAL ADVANTAGE SHIFTING MECHANISM

Joseph D. Reynolds, Climax, and Alan R. Davis, Plainwell, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 8, 1982, Ser. No. 440,121

Int. Cl.³ G05G *9/18, 7/04;* **F16D** *23/06*

U.S. Cl. 74—339 **19 Claims**



1. A compound variable mechanical advantage/variable effective length shifting mechanism for axially moving a shift rail of a synchronized positive clutch transmission of the type comprising synchronzied positive clutches wherein the axial movement of a shift rail and a shift fork carried thereby will axially move a synchronized positive clutch member and wherein the axial movement of said synchronized positive clutches from a fully disengaged axial position to a fully engaged axial position comprises a first segment of axial movement wherein the axially movable positive clutch member is moved into engagement with the blocking means and the frictional synchronizing clutches are initially engaged, a second segment of axial movement wherein the frictional synchronizing clutches are fully engaged to bring the positive clutch members into substantially synchronous rotation and a third segment of axial movement occuring after substantial synchronization of the positive clutch members wherein the axially movable clutch member moves past the blocking means into positive engagement with another positive clutch member, said second segment of axial movement of said positive clutch member requiring a substantially higher axial force than is required during said third segment of axial movement of said positive clutch member, said compound shifting mechanism comprising;

a first member comprising a variable mechanical advantage/variable effective length first class lever defined by a substantially rigid first body having a first lever portion extending from a first end to a first fixed pivot axis and a second lever portion extending from said first pivot axis to a second end, said second lever portion carrying a force applying member fixed for pivotal movement therewith about said first pivot axis and movable from a first position spaced from said first pivot axis by a first distance to a second position spaced from said first pivot axis by a second distance, said second distance greater than said first distance;

a second member comprising a variable mechanical advantage/variable effective length second rigid body, said

second rigid body pivotably mounted about a second fixed pivot axis parallel to and spaced from said first pivot axis, said second body extending from said second pivot axis toward said second lever portion of said first member, said second member defining an axially extending surface extending axially from a third point spaced from said second pivot axis by a third distance axially toward said second portion to a fourth point spaced from said second pivot axis by a fourth distance, said fourth distance greater than said third distance, said force applying member engageable with said contact surface from said third to said fourth point, said force applying member engageable with said contact surface at said third point when in said second position and at said fourth point when in said first position;

a shift finger fixed to said second member for pivotal movement about said second pivot axis therewith, said shift finger axially displacable in an axial direction perpendicular to a line drawn through said first and second axes and engageable with said shift rail for axially moving said shift rail along an axes substantially perpendicular to said line drawn from said first to said second pivot axes; and

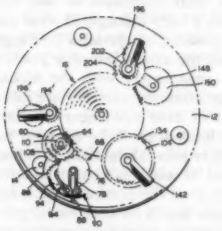
resilient biasing means for biasing said force applying member to said second position thereof, the biasing force of said biasing means selected so that the force required to axially displace said shift finger during said third segment of axial movement of said positive clutch member is insufficient to cause said force applying member to move from said second to said first position thereof and the force required to axially displace said shift finger during said second segment of axial movement of said positive clutch member is sufficient to cause said force applying member to move from said second to said first position thereof.

4,515,030

EXTENDED RANGE VARIATOR FOR FUEL PUMP COMPUTER

Tom Stephenson, Simsbury, Conn., assignor to Petroleum Meter & Pump Co., Inc., Avon, Conn.

Filed Dec. 30, 1982, Ser. No. 453,332
Int. Cl.³ F16H 3/22
U.S. Cl. 74—348 **22 Claims**



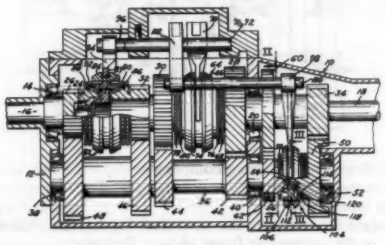
1. In a variator for a fuel pump computer having a frame, a rotatable primary cone gear stack mounted therein comprised of a multiplicity of gears of different proportionate sizes affixed upon a shaft for operative connection to a fuel pump metering device, three range arm assemblies mounted in said frame and having means for selective meshing engagement with each of said gears of said primary gear stack and having a shaft offset from the axis thereof, and a primary rotary summing mechanism coaxially mounted with said primary gear stack for operative engagement with said range arm assemblies to combine the rotary outputs thereof; the improvement comprising a supplemental range mechanism mounted on said frame and including: a secondary cone gear stack comprised of a multiplicity of gears of different proportionate sizes affixed upon a shaft and disposed on an axis offset from that of said primary gear stack, said secondary cone gear including a drive gear affixed upon said shaft thereof in direct meshing engagement with one of the gears of said primary cone gear for operative connection to said metering device, and means other than said three range arm assemblies for selectively operatively connecting each of said gears of said secondary gear stack to said primary summing mechanism, said other means comprising a selector assembly pivotably mounted adjacent said primary and secondary cone gear stacks, said assembly including an arm member which is movable thereon along an axis parallel to the axis of pivoting thereof, and a selector gear rotatably mounted on said arm member for selective engagement with each of said gears of said secondary cone gear stack to establish such operative connection with different proportionate input rates, whereby the rotary output from said secondary gear stack can be combined with the rotary output of said range arm assemblies to generate a cumulative proportionate rotary output from said primary summing mechanism.

4,515,031

CHAIN DRIVEN REVERSE GEAR FOR A MANUAL TRANSMISSION

David A. Janson, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 28, 1982, Ser. No. 425,826
Int. Cl.³ F16H 3/08, 3/38, 3/14
U.S. Cl. 74—359 **7 Claims**



1. A multiple speed ratio manual transmission comprising:

an input shaft adapted to be clutched to the crankshaft of an internal combustion engine, the shaft having an input gear secured thereto;

a countershaft having a gear fixed thereto in meshing engagement with the input gear;

an output shaft;

gearing defining a torque delivery path that includes a pair of meshing gears, one gear carried by the output shaft and one gear supported, at least in part, on the countershaft;

a first sprocket wheel carried by the countershaft and a second sprocket wheel carried by the output shaft;

a flexible, endless drive belt or chain engaging the sprocket wheels;

coupler means including a first coupler for selectively connecting one gear of the meshing gear pair and one sprocket wheel to the shaft on which said gear and said sprocket wheel are supported; and

a drive ratio selector mechanism having a first shift fork adapted to move the coupler means selectively into engagement with said gear and said sprocket wheel;

wherein the countershaft is rotatably mounted on bearings, a portion of the countershaft extending axially beyond the bearings, said extending portion providing a splined surface for supporting and connecting the coupler means to the shaft and providing means for at least partially rotatably supporting said gear of said meshing gear pair.

4,515,032

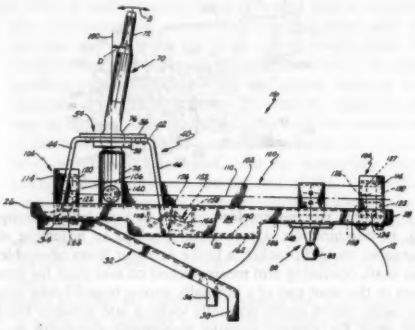
DROP-IN TYPE SHIFTER WITH DISPLACED SHIFT STICK

Bruce E. Olmsted, Fruitport, Mich., assignor to JSJ Corporation, Grand Haven, Mich.

Filed Sep. 30, 1982, Ser. No. 429,516

Int. Cl.³ B60K *20/04;* **G05G** *13/00;* **C07C** *107/08*

U.S. Cl. 74—473 R **24 Claims**



8. A drop-in shifter mechanism for use with a vehicle transmission, said mechanism comprising:

an elongated frame;

bracket means joined to said frame for securing said frame to the vehicle transmission;

a manually actuable shift stick having an upper end and a lower end;

stick mounting means on said frame for mounting said shift stick to said frame for multi-axis movement in a pair of orthogonal planes, said stick mounting means allowing sliding movement of said shift stick in one plane and pivotal movement in the other plane;

an elongated bar having a longitudinal axis, said shift stick lower end being pivotally secured to said elongated bar;

bearing means on said frame and supporting said bar for rotational movement of said bar about said longitudinal axis and for sliding movement of said bar along said longitudinal axis upon movement of said shift stick upper end; and

a gear actuating lever secured to said bar at a point spaced along said longitudinal axis of said bar from said shift stick lower end, said lever having a lower end including means for changing the drive ratio of the transmission, whereby said gear actuating lever may be dropped into said transmission and said shift stick may be offset from the centerline of the vehicle transmission.

4,515,033

DUAL MODE SHIFTER FOR AUTOMATIC TRANSMISSIONS

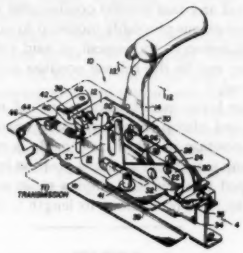
Louis D. Carlo, Litchfield, Ohio, assignor to Mr. Gasket Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 189,430, Sep. 22, 1980, Pat. No. 4,370,897. This application Jun. 9, 1982, Ser. No. 386,672

Int. Cl.³ G05G *7/06;* **F16H** *57/06;* **G09F** *9/00*

U.S. Cl. 74—476 **45 Claims**

1. A shifter for an automatic transmission comprising ratchet means operable to control said transmission through some of its gears in a ratchet mode of operation and gate means operable to control said transmission through all of its gears in a gate mode of operation, said shifter further comprising a main frame and a handle, means to mount said handle on said main frame to permit said handle to control said ratchet means and said gate means and to move between controlling said ratchet means and said gate means, said ratchet means comprising ratchet teeth and a ratchet pawl, said ratchet pawl being mounted in link means, said link means being controlled by said handle means so that said pawl cooperates with said ratchet teeth when said shifter is operated in said ratchet mode, and



said link means being operative to keep said pawl out of operative engagement with said ratchet teeth when said shifter is operated in said gate mode.

4,515,034

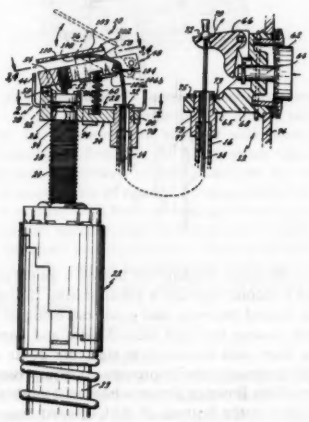
CONTROL MECHANISM FOR HYDRAULIC LOCKING DEVICE

Clyde R. Porter, Woodland Hills, Calif., assignor to P. L. Porter Co., Woodland Hills, Calif.

Continuation-in-part of Ser. No. 157,356, Jun. 9, 1980, Pat. No. 4,354,398. This application Aug. 27, 1982, Ser. No. 412,242

Int. Cl.³ F16C *1/10*

U.S. Cl. 74—501 R **6 Claims**



1. A control mechanism for use with a hydraulic device employed to control relative movement between two members, said hydraulic device including a hydraulic locking device including a hydraulic cylinder connected to one of the members, a piston rod extending outwardly through one end of the hydraulic cylinder and terminating in an exposed end of the piston rod and connected to the other of the two members, and an operating rod operative when moved to a release position with respect to the piston rod to release the hydraulic locking device to thereby allow relative movement between the two members, said control mechanism comprising in combination:

a conduit having a proximal end associated with the piston rod and having a distal end;

a cable extending through said conduit, slidable within it and including a proximal end and a distal;

push button means affixed to the distal end of said conduit

for moving said cable under control of an operator through a stroke with respect to said conduit;

a mounting base;

retaining means mounted to said base for engaging said piston rod and said pivotal conduit end respectively;

output lever means pivotably mounted to said mounting base and responsive to movement of said cable to move the operating rod to the release position with respect to the piston rod;

said output lever means having pair of normally parallel fingers and clamp means manually movable between a release position in which said cable is movable through said clamp means and a locked position in which the cable is clamped between said fingers at an arbitrary continuously selectable point along its length to said output lever.

4,515,035

CURVED CABLE SUPPORT MEMBER FOR BOWDEN LIFTERS

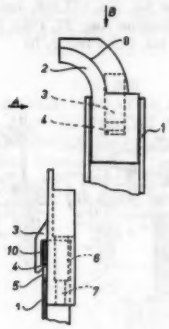
Klaus Küster, Ehringshausen, Fed. Rep. of Germany, assignor to Küster & Co. GmbH, Ehringshausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 326,038, Nov. 30, 1981, abandoned. This application May 14, 1984, Ser. No. 608,939

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 8032764[U]

Int. Cl.³ F16C *1/10*

U.S. Cl. 74—501 R **3 Claims**



1. In a Bowden window lift having a guide rail with a first end and a second end and a cable passing through said guide rail and around the ends, said guide rail being of U-shape with a bottom having first and second sides and parallel sides extending from said bottom first side, the guide rail having a material thickness, the improvement comprising preventing kinking of the Bowden sleeve where said guide rail comprises a clearance in the bottom of its U-shaped cross-section, and curved cable support members positioned in said U-shape and set against said first end and said second end, each said support member comprising:

(a) at least one first catch means projecting from a side of said support member adjacent said first bottom side of said guide rail;

(b) said projecting catch means being undercut and defining a free gap adjacent said bottom second side about said material thickness of said guide rail (1) which exists between a free standing lip (3) and said support member said free standing lip being attached to said side of said support member; and

(c) said free standing lip (3) being provided at its inside with a beak (4) entering said clearance (5) in said guide rail, whereby said support member is slipped onto one of said ends of said guide rail and secures said support member against being pulled off said guide rail.

4,515,036

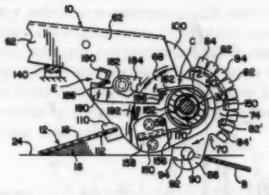
VEHICLE PARKING BRAKE SELF-ADJUSTING CONTROL MECHANISM

Jarvis L. Dotson, Detroit, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Apr. 25, 1983, Ser. No. 488,029

Int. Cl.³ G05G *5/18*; F16C *1/22*

U.S. Cl. 74—535 **19 Claims**



1. Control mechanism for vehicle parking brakes comprising, in combination, a mounting bracket, an adjusting shaft journaled on said bracket, a brake actuator lever pivotable on said shaft, operating arm means locked on said shaft for attachment to the head end of a normally spring biased brake actuating cable, clutch means normally locking said actuator lever to said shaft for unitary rotative movement therewith in one direction to set the parking brakes and in the other direction on release of said brakes, locking means for locking said lever in a brake setting pivotal position on said bracket, adjusting spring means normally urging said operating arm means in said one rotative direction, and release means actuated by said actuator lever, on pivotal return movement thereof from its brake set to its brake released position, for disengaging said clutch means to permit said adjusting spring means to rotate said shaft in said one direction relative to said actuator lever, to take up slack in the brake cable and maintain a predetermined minimum tension therein.

4,515,037

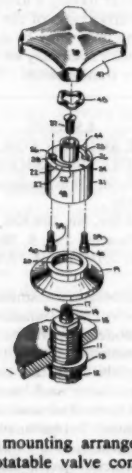
HANDLE ASSEMBLY

Dale A. Block, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Apr. 1, 1983, Ser. No. 481,576

Int. Cl.³ G05G *1/10*

U.S. Cl. 74—553 **3 Claims**



1. In a concealed mounting arrangement for attaching a valve handle to a rotatable valve control stem so that the handle is capable of rotating in both a clockwise and a counter-

clockwise direction to control flow volume, the combination comprising:

an adapter element fixedly mountable on the stem;

a handle element mountable on the adapter with a fit that allows relative rotational and axial movement therebetween;

one of said elements being provided with a connecting pin that extends towards the other element and has an enlarged head near its outer end;

the other of said elements being provided with a mounting slot comprising an access opening that faces said one element and receives the head therethrough when the elements are moved axially toward each other, an intermediate portion leading from the access opening in a direction of a relative rotation between the elements, and that includes a shoulder engageable with the inward side of the head during such rotation to prevent the elements from moving axially apart, and an outwardly facing pocket portion adjacent the far end of the intermediate portion that can receive the head when it is aligned therewith, said head and pocket then being constructed and arranged so that a portion of the head abuts laterally against the pocket to prevent relative rotation of the elements; and

a spring member between said elements that is compressible to allow the elements to be moved axially towards each other to allow the head to enter the access opening and to be rotated into alignment with the pocket, and that is expandable to cause the head to be moved into and held in the pocket.

4,515,038

POWER TRANSMISSION MECHANISM FOR MOTORCYCLES

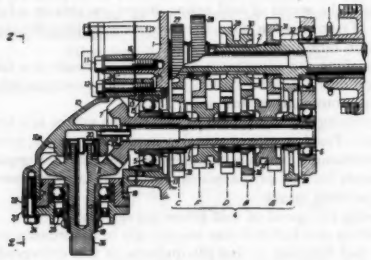
Masaharu Tsuboi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,881

Claims priority, application Japan, Mar. 25, 1981, 56-43403; Mar. 30, 1981, 56-46676; Mar. 30, 1981, 56-46677; Apr. 2, 1981, 56-49843

Int. Cl.³ F16H *57/02*; B62M *11/10*

U.S. Cl. 74—606 R **1 Claim**



1. A power transmission mechanism for a motorcycle, comprising

a transmission casing having a wall provided with an opening therethrough;

a change speed gear mechanism mounted in said transmission casing and including a countershaft having one end projecting out of said transmission casing through said opening;

a driving bevel gear formed integrally on the projecting end of said countershaft;

a final gear case including fasteners detachably fixing said final gear case to said transmission casing;

axially spaced bearings supporting said countershaft within said transmission casing;

a first bearing holder mounted in said opening and secured to said final gear case and engaging one of said bearings;

a second bearing holder engaging the same bearing and carried by said final gear case;

a final shaft rotatably mounted in said final gear case and having a driven bevel gear integrally formed therewith and meshing with said driving bevel gear;

a final shaft bearing mounted within said final gear case;

said final gear case, said bearing holders, said driving bevel gear, said countershaft, said driven bevel gear, said final shaft and a plurality of the gears on said countershaft of said change speed gear mechanism being separable from said transmission casing as a unit with release of said fasteners.

4,515,039

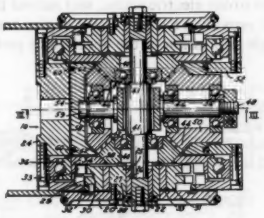
ROBOT JOINT

Keith W. Nord, Stillwater, Minn., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 18, 1983, Ser. No. 524,273

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—665 C **4 Claims**



1. A robot joint comprising a housing, dual input means on opposite sides of the housing, single output means, reduction means secured for rotation with each of said input means within said housing, a first pair of bevel gears operatively connected to said respective reduction means for rotation thereby, and a second pair of oppositely disposed bevel gears, each of which meshes with both of said two bevel gears, said single output means being secured to one of said second pair of bevel gears, the speed and direction of rotation of said single output means and the raising and lowering thereof being controlled by the relative speeds and directions of rotation of said respective input means.

4,515,040

CONTROL APPARATUS AND METHOD FOR ENGINE-CONTINUOUSLY VARIABLE TRANSMISSION

Yasuhisa Takeuchi; Yoshiro Morimoto, and Tadashi Suzuki, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 26, 1982, Ser. No. 411,987

Claims priority, application Japan, Aug. 27, 1981, 56-133327; Sep. 3, 1981, 56-137826; Sep. 3, 1981, 56-137827

Int. Cl.³ B60K *41/12, 41/18*

U.S. Cl. 74—866 **27 Claims**

1. A control apparatus for a motor vehicle having an accelerator pedal, an engine having an intake pipe and a continuously variable transmission, the continuously variable transmission having a drive shaft drivingly connected to the engine, a driven shaft, a drive pulley including a cylinder chamber, a fixed conical disc secured to the drive shaft and a movable disc controllably movable in an axial direction of the drive shaft in response to fluid pressure in the cylinder chamber thereof, a driven pulley including a cylinder chamber, a fixed conical disc secured to the driven shaft, a movable disc controllably

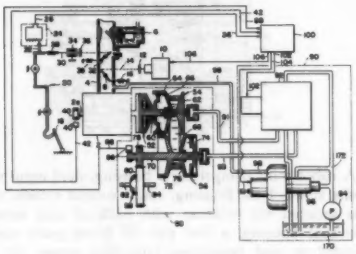
movable in an axial direction of the driven shaft in response to fluid pressure in the cylinder chamber thereof, and a V-belt running over the drive and driven pulleys to establish a driving connection therebetween, said control apparatus comprising:

an accelerator pedal sensor means coupled with the accelerator pedal for generating an accelerator pedal stroke electric signal indicative of a depression degree of the accelerator pedal;

an engine revolution speed sensor means coupled with the engine for generating an actual engine revolution speed electric signal indicative of an actual revolution speed of the engine;

means for generating an output electric signal indicative of a target engine revolution speed, said output electric signal generating means coupled with said accelerator pedal sensor means for generating a first target engine revolution speed electric signal which is a first predetermined function of said accelerator pedal stroke electric signal, said first predetermined function providing a single target engine revolution value for any single depression degree of the accelerator pedal;

a fuel supply device control means coupled with said accelerator pedal sensor means for generating a target engine torque electric signal indicative of a target engine torque which is a second predetermined function of said accelerator pedal stroke electric signal, said second predetermined function providing a single target engine torque value for any single depression of the accelerator pedal;



a comparator means coupled with said engine revolution speed sensor means and said output electric signal generating means for generating a deviation signal indicative of a difference between said actual engine revolution speed electric signal and said output electric signal;

a pumping means for supplying hydraulic fluid;

means for detecting an actual reduction ratio within said continuously variable transmission;

means coupled with said pumping means for regulating the fluid supplied by said pumping means in response to the detected actual reduction ratio within the continuously variable transmission and generating a line pressure variable with the detected actual reduction ratio;

a shift control valve driver means coupled with said comparator means for generating an electric command signal in response to said deviation signal;

a shift control valve means coupled with said line pressure generating means to receive said line pressure for controlling fluid supply to said both cylinder chambers and fluid discharge therefrom in response to said electric command signal;

a fuel supply device communicating with the intake pipe and including a control element means for adjusting supply of fuel to the engine; and

means coupled with said fuel supply device control means for actuating said control element means in response to said target engine torque electric signal.

4,515,041

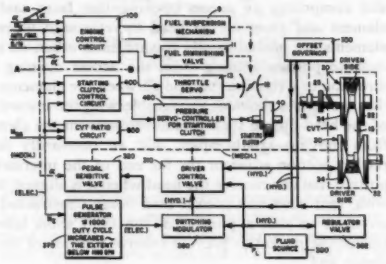
CONTROL SYSTEM AND METHOD FOR A POWER DELIVERY SYSTEM HAVING A CONTINUOUSLY VARIABLE RATIO TRANSMISSION

Andrew A. Frank, and Takashi Omitsu, both of Madison, Wis., assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation-in-part of Ser. No. 380,923, May 21, 1980,. This application Apr. 27, 1983, Ser. No. 489,177

Int. Cl.³ B60K *41/18, 41/12*

U.S. Cl. 74—866 **73 Claims**



1. A method of controlling the operation of a power delivery system including a prime mover and a continuously variable ratio transmission coupled to said prime mover for delivering power from said prime mover to an output shaft, said transmission having adjustable driver means operatively coupled to said prime mover for adjustably transmitting power from said prime mover, and adjustable driven means operatively coupled to said driver means and to said output shaft for adjustably transmitting power from said driver means to said output shaft, the ratio of said transmission being determined by the relative adjustments of said driver means and said driven means, said prime mover having fuel delivery means for delivering a variable quantity of fuel thereto, said power delivery system being controlled by command means for commanding a desired system performance, the method comprising the steps of:

measuring the actual performance of the power delivery system;

controlling the ratio of said transmission as a function of the desired system performance commanded by said command means and said measured actual system performance, the speed of said prime mover varying as a function of transmission ratio, the step of controlling the transmission ratio comprising:

controlling the adjustment of said driver means as a function of the desired system performance commanded by said command means; and

controlling the adjustment of said driven means as a function of said measured actual system performance; predetermining a fuel function defining desired fuel requirements for said prime mover in relation to prime mover operating speed;

measuring the speed of said prime mover; and

controlling said fuel delivery means only in accordance with said fuel function so that the quantity of fuel delivered to said prime mover is determined only by the speed thereof.

4,515,042

SERVICE TOOL MEANS FOR RACK AND PINION STEERING SYSTEMS

Tony E. Martin, Cahokia, Ill., assignor to Moog Automotive, Inc., St. Louis, Mo.

Filed Mar. 28, 1983, Ser. No. 479,510

Int. Cl.³ B25B *13/06*

U.S. Cl. 81—55 **3 Claims**

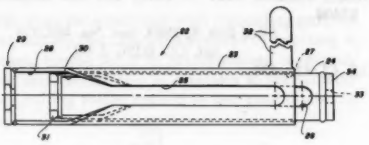
1. In a service tool means for use in servicing a rack and pinion steering assembly in which a ball joint threadedly connected to the end of the rack bar in the steering assembly has

a diameter larger than the diameter of the end of a rack bar extending from the ball joint, the improvement in such a tool which comprises:

(a) a first elongated hollow body having at one side an open notch adjacent one end and an elongated slot extending from said side open notch toward the opposite end;

(b) first jaw means carried by said first body adjacent said open notch, said first jaw means having fixed elements providing a predetermined space therebetween for receiving a rack bar to be held by said first body against rotation;

(c) a second elongated hollow body operably supported within said first body, said second body having at one side an open notch adjacent one end and an elongated slot extending from said side open notch and substantially matching said elongated slot in said first body, said notches and elongated slots being sized for passing the tie



rod and ball joint through said first body and into said second body;

(d) second jaw means carried by said second body adjacent said open notch, said second jaw means having fixed elements providing a predetermined space therebetween larger than said first mentioned jaw means for receiving the larger diameter ball joint to be held in said jaw means; and

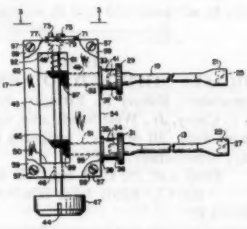
(e) force applying means carried by each of said first and second bodies for effecting turning of one of said jaw means relative to the other jaw means to thread said ball joint relative to said rack bar, said force applying means relatively rotating said first and second hollow bodies to bring said notches and elongated slots into alignment for the placement of said tool means over the ball joint housing and tie rod.

4,515,043

CARBURETOR ADJUSTMENT TOOL

Billy C. Gray, Los Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1983, Ser. No. 519,932
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.22 **5 Claims**



1. A carburetor adjustment tool comprising:

a pair of shrouded screwdriver blades attached to a gear box through flexible shanks;

said gear box having a front wall and a rear wall;

said gear box having a main shaft running therethrough which is connected to a hand operable knob at one end thereof;

said main shaft has an enlarged end opposite from said knob and said enlarged end is journaled in a bore in the rear wall of said gear box;

said main shaft having a pair of bevel gears thereon which can engage mating bevel gears on two output shafts which are connected to said shanks;

said main shaft being spring loaded so that said bevel gears are normally engaged;

means for disengaging said pair of bevel gears on said main shaft from said mating bevel gears on said output shafts by sliding said main shaft toward said rear wall such that said enlarged end exits from said bore;

means for latching said gears in the disengaged position;

said means for latching said gears in the disengaged position is pivoted on the outside of said rear wall such that it is pivotally movable under the enlarged end of said main shaft when said main shaft has been slid toward said rear wall; and

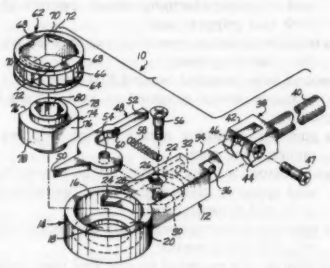
each of said shanks having hand operable discs thereon.

4,515,044

QUICK CHANGE RATCHET WRENCH

Larry V. Harstad, 19326 Pac. Hwy. S., Space 10, Des Moines, Wash. 98188

Filed Oct. 23, 1980, Ser. No. 200,255
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—61 **4 Claims**

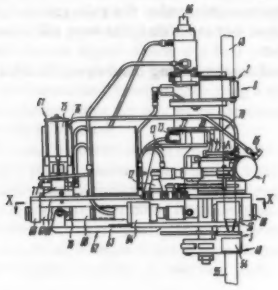


1. A quick change ratchet wrench comprising: a handle having an integral head on one end with said head having a cylindrical shaped opening extending in from one side of the head, and a concentric smaller diameter circular opening extending in from the other side of the head to form a lip, a hollow cylinder sized to rotatably fit in the cylindrical shaped opening with said cylinder having a narrow recess with ratchet teeth around the periphery and having a lip adjacent opposite sides of the hollow interior, an insert sized to fit inside and to move with the hollow cylinder and contained by the lip in the cylinder and the lip in the opening in the head with said insert having means for joining to a fastener, a ratchet teeth contacting pawl pivotally mounted in the handle with said pawl having a resiliently held lever arm extending outside the handle to permit the pawl to be moved out of contact with the ratchet teeth to permit entry and removal of the cylinder from the head.

4,515,045
AUTOMATIC WRENCH FOR SCREWING A PIPE STRING TOGETHER AND APART

Viktor V. Gnatchenko; Nikolai P. Makarov, both of Moscow; Albert S. Shaginian, Gomel; Alexei G. Asan-Dzhalalov, Gomel; Anatoly A. Pevnev, Gomel; Valery A. Panteleev, Gomel; Alexandr P. Androsenko, Gomel; Nikolai I. Davidenko, Gomel; Zoya N. Mochalova, Gomel, and Leonid N. Palkin, Gomel, all of U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Seismicheskoi Tekhniki, Gomel, U.S.S.R.

Filed Feb. 22, 1983, Ser. No. 468,482
Int. Cl.³ B25B *23/00*
U.S. Cl. 81—429 4 Claims



1. An automatic wrench for screwing together and apart a string of pipes joined with threaded collars, said automatic wrench comprising:

a first base;

a high-torque device mounted on said first base and including:

a rotatable clamping means having grippers adapted to embrace a pipe;

an actuator for bringing together and apart the grippers of said rotatable clamping means, operatively connected with said grippers; and

a rotation actuator, operatively connected with said rotatable clamping means;

a second base mounted on said first base;

a low-torque device mounted on said second base and including:

a spinning clamping means having grippers adapted to embrace the pipe;

an actuator for bringing together and apart the grippers of said spinning clamping means, operatively connected with said grippers; and

a spinning actuator operatively connected with said spinning clamping means;

a locking device mounted on said first base under said high-torque device and comprising:

a locking clamping means having grippers adapted to embrace a pipe string on the external side surface of a threaded collar;

an actuator for bringing together and apart the grippers of said locking clamping means, operatively connected with said grippers; and

a means for a movable attachment of said second base on said first base; and

a control system comprising:

a system of detectors, including:

a torque detector installed on said high-torque device for delivering a signal when the torque developed by said high-torque device reaches as preset value; and

a rotation angle detector installed on said high-torque device for delivering a signal when the angle of rotation of said rotatable clamping means with respect to said locking clamping means reaches a preset value;

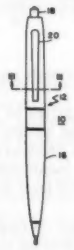
a control unit for generating control commands based upon the signals of the detectors of said system of detectors, said control unit comprising a unit monitoring the duration of the execution of a command and an AND gate, and the AND gate, upon receiving the signals from said torque detector and rotation angle detector within a preset time measured by said unit monitoring the duration of the execution of a command, outputs a signal indicative of the end of the rotation of the pipe by said high-torque device; and

a system of electrically controlled actuating mechanisms acting upon said actuators of said devices under commands from said control unit.

4,515,046
RETRACTABLE TORQUE APPLYING TOOL

Gilbert Johnson, 3561 N. Leroy St., San Bernardino, Calif. 92404

Filed Feb. 8, 1983, Ser. No. 465,038
Int. Cl.³ B25G *1/08*
U.S. Cl. 81—436 16 Claims



1. A retractable screwdriver comprising:

housing means incorporating a gear rigidly attached thereto, for housing said screwdriver;

first geared cam means rigidly attached to a rear end portion of said screwdriver for engaging said housing gear in an advanced position of said screwdriver, and for maintaining a substantially fixed angular displacement between said screwdriver and said housing means,

manually operable plunger means for rapidly advancing and retracting said screwdriver, including second geared cam means having means for engaging said housing gear, thereby establishing a substantially fixed angular displacement between said plunger means and said housing means, said second geared cam means having further means for cammingly contacting said first geared cam means thereby to advance said tool to an operable position.

4,515,047
DYNAMICALLY STIFFENED ROTARY TOOL SYSTEM

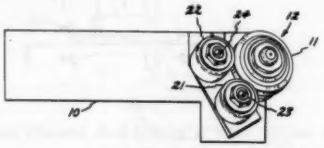
Ranga Komanduri; Robert H. Ettinger, both of Schenectady; Morton P. Casey, Jr., West Sand Lake, and William R. Reed, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,436
Int. Cl.³ B23B *1/00;* B26D *1/12*
U.S. Cl. 82—1 C 5 Claims

1. In a rotary cutting tool construction comprising in combination a longitudinally-extending spindle affixed at one end thereof in a tool shank, a rotatable cutting disc assembly including a cutting disc mounted on said spindle and antrifriction bearing means disposed between said spindle and said cutting disc assembly, the improvement comprising rotatable means for dynamically stiffening said spindle, means mounted on said tool shank supporting said dynamic stiffening means for rotation adjacent said cutting disc assembly and in direct contact

with said cutting disc for the application of at least one biasing force of preselected magnitude against said cutting disc.

4. In the process of rotary tool machining in which a rotary tool having a rotatable cutting disc is mounted on stationary support means is presented into contact with a workpiece to



remove material from the workpiece with succeeding portions of said rotating cutting disc, the improvement of applying at least one dynamic biasing force of predetermined magnitude directly against said cutting disc as it rotates to substantially directly oppose cutting forces applied to said cutting disc by the workpiece.

4,515,048

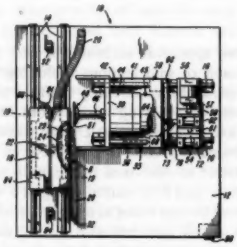
METHOD AND APPARATUS FOR TRIMMING LEAD WIRES PROJECTING FROM PRINTED CIRCUIT BOARDS

Glenn W. Forsell, 718 Market St., Brookville, Ohio 45309

Filed Aug. 1, 1983, Ser. No. 519,009

Int. Cl.³ B23D *33/02*

U.S. Cl. 83—13 **16 Claims**



1. A method of trimming lead wires projecting from one side of a printed circuit board supporting electronic components located on the other side of the board and wherein the lead wires are soldered within holes formed within the board, comprising the steps of supporting the printed circuit board by a flat supporting surface engaging the other side of the board, positioning a rotary cut-off blade with its axis substantially perpendicular to the supporting surface, relatively moving the blade and the supporting surface axially until the blade contacts the one side of the board, retracting the blade from the one side of the board by a predetermined distance to a retracted position, rotating the blade, and producing relative lateral movement between the board and the blade while the blade is rotating in the retracted position to shear the projecting lead wires at the predetermined distance from the one side of the board and independent of the thickness of the board.

4,515,049

QUICK-CHANGE TOOL HOLDER FOR LATHES

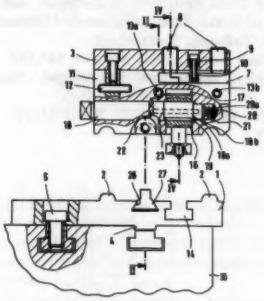
Peter Dietz, Büttelborn; Norbert W. Müller, Frankfurt, and Horst F. M. Kroh, Langen, all of Fed. Rep. of Germany, assignors to Pittler Machinenfabrik AG, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,228

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 8029160[U]

Int. Cl.³ B23B *29/00, 3/06;* **B23Q** *3/00*

U.S. Cl. 82—36 R **13 Claims**



1. A quick change tool holder for a lathe including a tool carriage, said holder comprising a support member adapted to be mounted on the tool carriage, a tool holder member adjacent said support member and including a first bore extending generally perpendicularly from said support member, and a second bore extending at about a right angle from said first bore, and means for attaching said tool holder member to said support member, said attaching means comprising a mounting member which is mounted on said support member, which is received in said first bore in said tool holder member, and which includes a bore, and a bolt which is received in said second bore and which is movable between an operating position wherein said bolt penetrates said bore in said mounting member and secures said mounting member in said first bore in said tool holder member, and a nonoperating position wherein said bolt is withdrawn from said bore in said mounting member so that said tool holder member is detached from said mounting member.

9. A quick change tool holder for a lathe including a tool carriage, said holder comprising a support member adapted to be mounted on the tool carriage, a tool holder member including a first bore extending generally perpendicularly from said support member, and a second bore extending at about a right angle from said first bore, and means for attaching said tool holder member to said support member, said attaching means comprising a mounting member which is detachably mounted on said support member, which is received in said first bore in said tool holder member, and which includes a bore, a bolt which is received in said second bore, which includes an eccentric portion, and which is axially movable between an operating position, wherein said eccentric portion penetrates said bore in said mounting member and secures said mounting member in said first bore in said tool holder member, and a nonoperating position, wherein said bolt is withdrawn from said bore in said mounting member so that said tool holder member is detached from said mounting member, and said eccentric portion, in response to rotation of said bolt, is radially movable between a first position, wherein said mounting member is retracted into said tool holder member, thereby clamping said tool holder member against said support member, and a second position, wherein said mounting member is extended from said tool holder member, thereby unclamping said tool holder member from said support member, and means for releasably securing said bolt in said operating position in re-

sponse to rotation of said bolt, said releasably securing means comprising said bolt further including a circumferential groove, and an axial groove in communication at one end thereof with said circumferential groove, and a member in said tool holder member which projects into said second bore and which is receivable in said axial groove and said circumferential groove.

4,515,050

APPARATUS FOR FEEDING SHEET METAL PLATES TO A SHEET SHEAR ARRANGEMENT

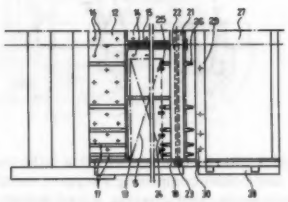
Eduard Haenni; Theo Frei, both of Zofingen, and Peter Hug, Safenwil, all of Switzerland, assignors to Hämmerle AG Maschinenfabrik, Zofingen, Switzerland

Filed Nov. 1, 1983, Ser. No. 547,583

Claims priority, application Switzerland, Nov. 9, 1982, 6488/82

Int. Cl.³ B23D *33/02*; B21D *43/11*

U.S. Cl. 83—71 **11 Claims**



1. An apparatus for feeding sheet metal plates to a sheet shear arrangement, especially a computerized numerically controlled sheet shear arrangement containing cutting blades, comprising:

a working table arranged in front of the sheet shear arrangement;

a feeding bar extending substantially parallel to the cutting blades of said sheet shear arrangement and having a first side facing said cutting blades and a second side located remote from said cutting blades;

drive means for reciprocatingly moving said feeding bar substantially perpendicular to said cutting blades and longitudinally of said working table;

elevationally displaceable first holding elements arranged on said first side of said feeding bar for gripping an edge of a sheet metal plate;

elevationally displaceable second holding elements arranged on said second side of said feeding bar for gripping an edge of a sheet metal plate;

said working table comprising at least two stationary table members and at least one downwardly pivotable table member; and

at least one intermediate support with which there is operatively connected said at least one downwardly pivotable table member.

4,515,051

KNIFE BLOCK GUIDE

Michael J. Phillips, Milmont Park, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 22, 1983, Ser. No. 534,921

Int. Cl.³ D06H *7/00*

U.S. Cl. 83—146 **9 Claims**

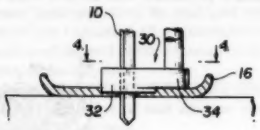
1. In a cutting machine including a thin, elongated cutting blade, and a foot positioned immediately above the material to be cut and through which the elongated cutting blade moves and extends into the material during a cutting operation, the improvement comprising:

guide means for the cutting blade; and

means for mounting the guide means to the foot,

said guide means defining an opening through which the elongated cutting blade moves and by which the elongated cutting blade is guided both laterally and transversely of its elongated extent, and

said opening being shaped to conform to the cross-sectional shape of the elongated cutting blade.



4,515,052

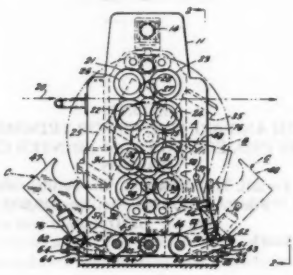
AUTOMATIC SLITTER

Stephen S. Flaum, Brooklyn, N.Y., assignor to S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,234

Int. Cl.³ B26D *3/08*, *11/00*

U.S. Cl. 83—479 **17 Claims**

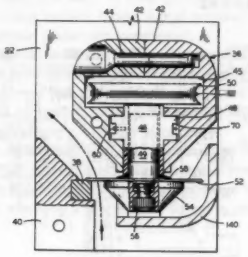


1. Slitter scorer apparatus including a first station and a second station; each of said stations including first, second, third and fourth parallel tool carrying shafts; a main relatively fixed frame; a sub-frame having said stations thereon; means defining a pivot axis disposed between said stations and about which said sub-frame is pivotable 180° between first and second positions relative to said fixed frame; with said sub-frame in said first position, said first station being at a working location and said second station being at a set-up location; with said sub-frame in said second position, said second station being at said working location and said first station being at said set-up location; a power driven common adjusting means for longitudinally positioning tools on said first, second, third and fourth parallel tool carrying shafts of both said first and second stations; said adjusting means disposed at said set-up location to move tools to selected axial positions along said shafts of the one of said stations at said set-up location while a web of sheet material is running along a path extending through the other of said stations; said set-up location and said adjusting means being entirely on one side of a plane in which said web moves through said stations; said adjusting means including adjusting elements selectively engageable in sequence with tools on said first, second, third and fourth shafts of the one of said stations disposed at said set-up location, with a first of said adjusting elements engaging in sequence cooperating tool sections on two of said shafts at said set-up location and a second of said adjusting elements engaging in sequence cooperating tool sections on two others of said shafts at said set-up location.

4,515,053
CONTINUOUS WEB FEEDER WITH WEB CUTTING MEANS

R. Clark DuBois, 332 Wakeman Rd., Fairfield, Conn. 06430

Filed May 16, 1983, Ser. No. 494,774
Int. Cl.³ B26D 1/18, 1/20
U.S. Cl. 83—488 15 Claims



1. In a continuous web feeder attachment for printers and the like, the combination comprising:

A. a housing including side frames;

B. a drive shaft extending transversely of said housing and mounted for rotation in said side frames;

C. a support shaft extending transversely of said housing and mounted in said side frames, said drive and support shafts being adapted to support paper feed means for advancing paper or the like through said feeder;

D. a cutter assembly supported on said housing and including a cutter wheel, means mounting said cutter wheel in said cutter assembly for rotation about an axis generally perpendicular to said drive and support shafts and for movement transversely of said housing between stop positions adjacent said side frames, said cutter wheel mounting means including slider means and guide means for said slider means;

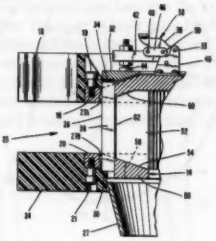
E. drive means for effecting movement of said cutter assembly between said stop positions, said drive means including a reversible drive electric motor, said drive means also including means for effecting rotation of said cutter wheel about its rotational axis during its movement between said stop positions, said cutter assembly drive means including a winch driven by said motor and drive cord means engaged with said winch and said slider means, whereby rotation of said winch will effect movement of said slider means, said cutter wheel rotation means including a second winch rotatably supported on said slider and engaged with said cutter blade to effect rotation thereof, a cutter rotating cord engaged about said second winch and extending to said side frames whereby movement of said slider causes said second winch to rotate said cutter blade; and

F. control means including means adapted to be actuated by a predetermined motion of the platen of the associated printer to actuate said electric motor, means to terminate motor operation upon movement of the cutter assembly from one stop position to the other stop position, and means for changing the direction of rotation of said motor upon movement of said cutter assembly from one stop position to the other stop position, said cutter wheel being adapted to cut the web in either direction of movement of said cutter assembly between said side frames.

4,515,054
CUTTER WHEEL FOR CUTTING CONTINUOUS TOW

William D. McLaughlin, Jr., Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,560
Int. Cl.³ D01G 1/04
U.S. Cl. 83—663 18 Claims



1. A cutting wheel for cutting continuous filamentary tow, comprising:

first and second carrier plates, said plates being rotatable about a common axis and being mutually spaced in the axial direction,

said second carrier plate defining a central exit opening,

an annular row of cutter blades extending between said first and second carrier plates,

said blades having radially outwardly facing cutting edges such that as filamentary tow is wrapped around said row of blades and pushed thereagainst, the tow is cut by said cutting edges and passes between said blades,

at least four connecting plates having opposite ends affixed to respective carrier plates to prevent mutual separation of said carrier plates in the axial and radial directions,

each connecting plate being aligned with an associated one of said blades,

each connecting plate being positioned radially inwardly relative to the associated blade and having a thickness substantially the same as that of said associated blade,

said connecting plates as a group providing a substantial portion of the resistance against mutual separation of said carrier plates in the axial and radial directions,

said blades as a group transmitting a substantial portion of the torque between said carrier plates.

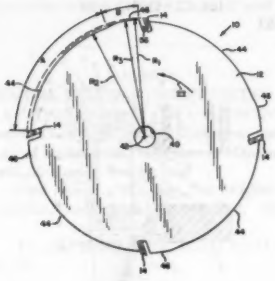
4,515,055
CIRCULAR SAW BLADE

Lewis A. Scott, Lake Oswego, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Division of Ser. No. 404,850, Aug. 3, 1982, Pat. No. 4,432,264, which is a continuation-in-part of Ser. No. 292,572, Aug. 13, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,587
Int. Cl.³ B27B 33/08; B23D 61/04
U.S. Cl. 83—835 9 Claims

1. A saw blade comprising a substantially circular integral main body with a plurality of circumferentially spaced cutter tips secured thereto and projecting radially outwardly therefrom, the outer end of a tip being positioned to describe an arc during rotation of the blade which is at a first radius, a tip having a front surface in the direction of rotation of said blade during operation, said main body having a peripheral edge defining a circular arc at a second radius throughout a major portion of its circumference, a depth gauge portion on said main body associated with and leading a tip and having a radially outwardly facing guide surface which describes an arc at a third radius during rotation which is intermediate said first and second radii, said guide surface of the depth gauge portion being connected with the peripheral edge of said main body through a transition section which curves from concave to

convex on progressing from said peripheral edge to said guide surface, and a chip clearance channel intermediate said front face of a cutter tip and its associated depth gauge, said channel



extending generally radially inwardly from said guide surface to a region spaced radially inwardly from said second radius and having a width measured circumferentially of said blade in a range of 0.030 to 0.100 inch.

4,515,056

ELECTRONIC MUSICAL INSTRUMENT

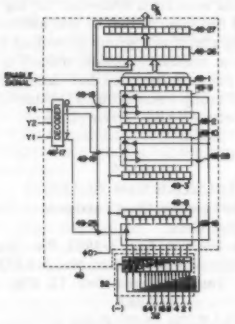
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan

Division of Ser. No. 215,024, Dec. 10, 1980, which is a continuation of Ser. No. 020,749, Mar. 15, 1979, abandoned. This application Nov. 13, 1981, Ser. No. 320,887

Claims priority, application Japan, Mar. 18, 1978, 58-31369; Apr. 17, 1978, 53-45528; Apr. 20, 1978, 53-46836; Jun. 13, 1978, 53-71064

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **12 Claims**



1. An electronic musical instrument for simultaneously generating at most n musical sound waves by an n-channel time sharing process, comprising:

means for producing differential values of the musical sound waves;

delay control means coupled to receive the differential values of the musical sound waves;

setting means coupled to said delay control means for supplying said delay control means with a digital time value which enables said delay control means to delay said differential values of the musical sound waves; and

accumulating means coupled to said delay control means for accumulating said differential values of the musical sound waves which have been delayed by the digital time value supplied from said setting means.

4,515,057

MUSICAL SOUND WAVE GENERATING CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT

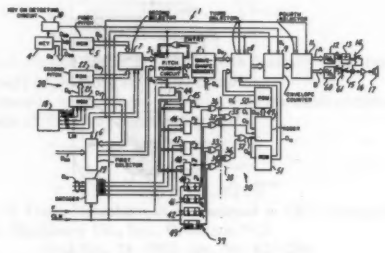
Yukichi Momoshima, and Nobuyuki Nagasaka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,477

Claims priority, application Japan, Jan. 21, 1982, 57-7894

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **7 Claims**



1. A musical instrument having a wave generating circuit comprising in combination: a keyboard having a plurality of keys; a first pitch ROM connected to said keyboard for determining a musical step; a first selector responsive to said keyboard; a second selector responsive to said first pitch ROM; a drum rhythm sound pitch data generating circuit connected as an input to both said first and second selectors; a pitch forming circuit responsive to both said first and second selectors; a wave-shape memory responsive to said pitch forming circuit; a noise rhythm sound forming circuit responsive to said pitch forming circuit and receptive of a clock signal during use of the wave generating circuit; a third selector responsive to both said wave-shape memory and said noise rhythm sound forming circuit; means for applying a play-rhythm musical sound wave-shape switching signal to said first, second and third selectors; an envelope counter responsive to said third selector; and audio amplifying means responsive to said envelope counter; whereby a drum rhythm of said drum rhythm sound pitch data generating circuit and a noise rhythm of said noise rhythm sound forming circuit are both generated using said one wave-shape memory.

4,515,058

ADAPTIVE TONE GENERATOR ASSIGNMENT IN A KEYBOARD ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jan. 27, 1984, Ser. No. 574,440

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.24 **9 Claims**

1. In combination with a keyboard musical instrument comprising a first and a second keyboard array of keyswitches and comprising a first and a second plurality of tone generators for generating musical tones, apparatus for assigning members of said first and second plurality of tone generators to actuated keyswitches comprising:

a keyswitch state detect means wherein a detect signal is generated in response to each actuated keyswitch in said first and in said second keyboard array of keyswitches,

an encoding means for encoding each said detect signal to generate a detect data word which identifies the corresponding actuated keyswitch and its associated keyboard array of keyswitches,

an assignor means responsive to said detect data word whereby one of said first plurality of tone generators is assigned to generate a musical tone associated with said first keyboard array of keyswitches if said detect data word identifies an actuated keyswitch on said first key-

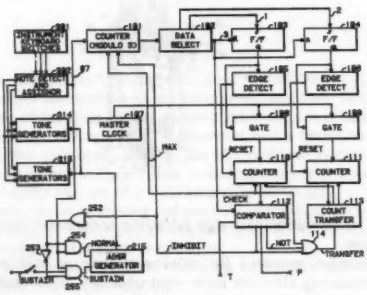
board array of keyswitches and whereby one of said second plurality of tone generators is assigned to generate a musical tone associated with said second keyboard array of keyswitches if said detect data word identifies an actuated keyswitch on said second keyboard array of keyswitches,

a first envelope modulation function generator for scaling the amplitudes of musical tones generated by assigned ones of said first plurality of tone generators wherein in response to a first sustain mode signal musical tones having a long release phase are generated,

a second envelope modulation function generator for scaling the amplitudes of musical tones generated by assigned ones of said second plurality of tone generators wherein in response to a second sustain mode signal musical tones having a long release phase are generated,

a sustain mode means wherein said first sustain mode signal and said second sustain mode signals are created,

a note sequence timing detect means responsive to each said detect signal whereby a first inhibit signal is generated if a



sequence of a prespecified number of detect data words encoded to identify actuated keyswitches on said first keyboard array of keyswitches occurs in a time interval less than a prespecified time interval and whereby a second inhibit signal is generated if said prespecified sequence of detect data words encoded to identify actuated keyswitches on said second keyboard array of keyswitches occurs in a time interval less than said prespecified time interval,

a release time control means whereby in response to said first inhibit signal said first sustain mode signal is not provided to said first envelope modulation function generator and whereby in response to said second inhibit signal said second sustain mode signal is not provided to said second envelope modulation function generator, and

a borrow assignor means interposed between said assignor means and said first and second plurality of tone generators whereby select ones of said second plurality of second tone generators are caused to generate musical tones corresponding to musical tones generated by said first plurality of tone generators.

4,515,059

GEARED TUNING MACHINE

Roger H. Siminoff, 112 Privada Luisita, Los Gatos, Calif. 95030

Filed Feb. 8, 1983, Ser. No. 464,932

Int. Cl.³ G10D *3/14*

U.S. Cl. 84—306 **10 Claims**

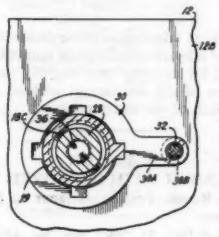
1. A universal tuning machine for tuning a string of a stringed musical instrument, said machine comprising:

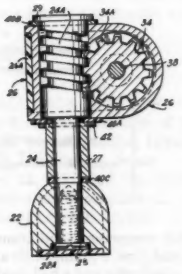
a. a two-part housing including a base and threaded flange means for threading onto mating threads of said base so as to mount said machine in an opening formed through a peghead portion of said stringed musical instrument;

b. a string post rotationally journalled through and aligned by said flange means for engaging said string to be tuned;

c. a worm gear-wheel member attached to said post and housed in a cavity defined by said housing;

d. a demountable rotatable tuning shaft journalled through a pair of aligned apertures defined by opposite sidewalls of said housing, said shaft including a collar at one end thereof extending beyond said housing for engaging a first semi-rigid washer bearing against an adjacent outer surface of a said sidewall, said shaft including a worm gear segment adapted for meshing with said worm gear-wheel member and for causing it to rotate as said shaft is rotated, said shaft further including a knob extension portion extending from said housing opposite from said collar;





e. removable tubular spacer bushing means placed over said knob extension portion of said tuning shaft and including a lip engaging a second semi-rigid washer bearing against an adjacent outer surface of said other sidewall, said spacer bushing means for retaining said shaft in proper alignment with said housing;

f. tuning knob means removably attached to the end of said knob extension portion of said shaft for enabling said shaft to be rotated, said tuning knob means including an inner surface engaging a third semi-rigid washer bearing against an adjacent surface of said tubular spacer bushing means;

whereby said shaft may be installed in two opposed orientations relative to said housing and along the same axis of rotation and further whereby said first, second and third semi-rigid washer means coact to inhibit stickiness in turning said tuning shaft by manipulating said knob means.

4,515,060

WIND INSTRUMENT WITH ADJUSTABLE TONE

Ernest Ferron, 14 rue Massacre, Rouen, France 76000

Filed Jan. 20, 1983, Ser. No. 459,320

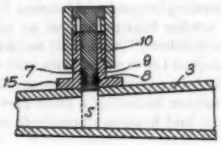
Claims priority, application France, Jan. 22, 1982, 82 0123

Int. Cl.³ G10D *7/00*

U.S. Cl. 84—380 R **5 Claims**

1. Wind instrument of the type with mouthpiece, single or double reed, lip, etc . . . , permitting to develop stationary

waves inside a column of air, comprising a device for laterally perturbing the column of air, wherein said lateral perturbation device comprises a piston adapted to slide inside a hollow body disposed laterally with respect to the column of air and issuing directly therein, the end of the piston which faces towards the



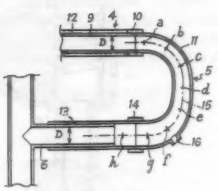
column of air being adapted to move inside the body and even to project out of it by encroaching on said column of air, means being provided for moving very slightly the piston, so as to change the tone of the instrument without really noticeably affecting the pitch of the instrument.

4,515,061

TRUMPET WITH IMPROVED TONE

Ernest Ferron, Rouen, France, assignor to Etablissement E. Ferron, France

Filed Dec. 21, 1982, Ser. No. 451,738
Claims priority, application France, Dec. 22, 1981, 81 23961
Int. Cl.³ G10D *7/10*
U.S. Cl. 84—394 **15 Claims**



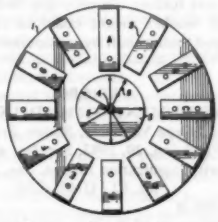
1. In a trumpet comprising, and connected in succession, a mouth piece, a lead pipe, a tuning slide assembly, a piston tube, a set of pistons, a bell tube and a bell, said tuning slide assembly in turn comprising an upper tube, a tuning slide bow having a curved portion, and a lower tube, the improvement wherein the inner bore defined by the tuning bow comprises a conical widening portion along only a portion of said curved portion.

4,515,062

MUSICAL INSTRUMENT HAVING A RIGID BASE WITH CIRCLE OF TONE BARS AND PATTERN GUIDES

Richard E. Bozung, Rte. 1, Box 286, Mt. Pleasant, S.C. 29464

Filed Apr. 6, 1983, Ser. No. 482,477
Int. Cl.³ G10D *13/08*
U.S. Cl. 84—403 **4 Claims**



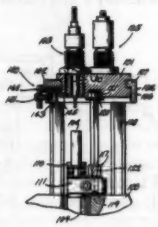
3. A musical instrument comprising a flat base having a plurality of tone generators mounted on one surface of the base, each of said tone generators being mounted along a radius of a circle defined by a center point on the base, the angular distance between radii having tone generators mounted thereon being approximately equal; and a circular guide mounted on said base coaxially with the circle of tone generators, said guide having indicia thereon indicating which of said plurality of tone generators have sounds among those in a desired musical scale or chord.

4,515,063

TURRET PRESS FOR RELOADING RIFLE AND PISTOL CARTRIDGES

Richard J. Lee, 3146 Kettle Moraine, Hartford, Wis. 53027

Filed Aug. 22, 1983, Ser. No. 525,101
Int. Cl.³ F42B *33/02*
U.S. Cl. 86—27 **24 Claims**



15. Ammunition cartridge reloading apparatus comprising:
a base,
a member mounted for moving relative to said base for executing alternate linear upstrokes and downstrokes and means for driving said member reversibly,
a die head mounted in fixed spaced relationship with respect to the base and above the base, said die head having a plurality of circularly and equiangularly arranged holes for retaining dies that respectively operate on cartridges,
a body mounted to said member,
a first ratchet element secured against rotation in said body, said element having a bore whose axis is parallel to the line of movement of said member and having longitudinally directed teeth surrounding the bore within a cavity in said body.
a hexagonal indexing rod extending longitudinally through said bore without engaging said first ratchet element, the upper end of said rod extending into said die head for freely rotating therein and the lower end of said rod being proximate to said base for rotating thereon, said rod having a region which is twisted about its axis through a predetermined angle,
a second ratchet element comprised of resilient plastic material and having a hexagonal bore of substantially the same size as said rod and fitting frictionally and slidably on said rod and slidably in said cavity, said second ratchet element having teeth surrounding its bore directed toward the teeth on the first element and selectively engageable with and separable from the teeth on the first ratchet element,
turret means supported for rotation in said body and constrained against longitudinal movement thereon, said turret means having a plurality of circularly and equiangularly arranged slot means for holding a corresponding plurality of cartridges, said hexagonal indexing rod extending through a corresponding hexagonal bore centrally of said turret means so rotation of said rod will index said turret means rotationally,
initiating a downstroke of said member after and upstroke causing said secured first ratchet element to engage said slidable second plastic ratchet element in said cavity such

that when said second element advances over said twisted portion of the indexing rod, said rod turns and drives said turret means rotationally through said predetermined angle, and initiating an upstroke of said member causes said elements to separate so said second element slides on said twisted portion without rotating the rod.

4,515,064

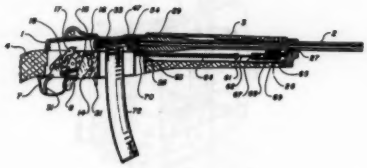
WEAPON RIM-FIRE CONVERSION UNIT II

Henry E. Hohrein, 3950 N. McDermitt Rd., Meridian, Id. 83642

Filed Mar. 14, 1983, Ser. No. 475,122

Int. Cl.³ F41D *7/03*

U.S. Cl. 89—128 **3 Claims**



1. A conversion unit improvement for utilizing 0.22 long rifle caliber ammunition in semi-automatic and fully automatic firearms of the type having an open receiver, a bolt assembly, an operating rod assembly, a magazine, and a barrel having a 223 caliber rifle bore, wherein the improvement comprises:

a replacement bolt assembly including a firing pin operable to strike the rim of a 0.22 long rifle cartridge;

a replacement operating rod assembly including gas venting means for venting to atmosphere gas formed in the barrel during discharge of the firearm;

a replacement magazine including an ejector operable to eject empty cartridges;

an auxiliary chamber including a forward portion having an exterior surface identical in form to the form of the ammunition cartridge for which the firearm was originally intended for precise locking engagement between the auxiliary chamber and the breech end of the barrel of the firearm, said chamber having a rearward portion operable to support the 0.22 caliber long rifle shell; and

said auxiliary chamber having a 0.22 caliber bore in registry and in alignment with the bore of said firearm.

4,515,065

AUTOMATIC CENTERING SERVO ACTUATOR

Ralph A. Hannmann, Jr., Medford, and James F. Higginbotham, Cherry Hill, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1982, Ser. No. 412,616

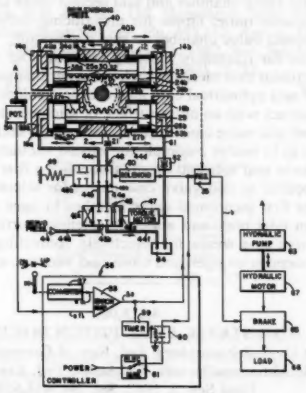
Int. Cl.³ F15B *9/03*

U.S. Cl. 91—363 A **6 Claims**

1. An automatic centering servo actuator comprising: a rotatable shaft;

hydraulic centering means for providing a constant centering force to center said shaft, including first and second pistons disposed within a first piston chamber on one side of said shaft, a slidable member disposed between said first and second pistons, stops disposed within the first piston chamber for limiting the inward stroke of said pistons such that each piston is prevented from traveling beyond a position necessary to center the slidable member with respect to the shaft, and a first pressurized source of hydraulic fluid communicating with the first piston chamber for conveying fluid to and from the ends thereof at a constant pressure as said pistons move within the chamber;

hydraulic working means for providing a working force to drive the shaft through its range of travel, including a double-action piston operatively disposed within a second piston chamber on the other side of said shaft from the first piston chamber, a second pressurized source of hydraulic fluid having a pressure range sufficient to overcome the centering force, and flow means connected



between said second source and the second piston chamber for directing the fluid to either end thereof; and

force transmission means drivingly connecting said hydraulic centering means and said hydraulic working means to said shaft.

4,515,066

VACUUM ACTUATOR

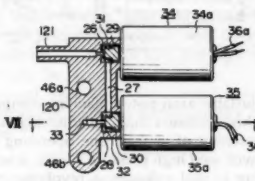
Tosikazu Ito; Kiyomi Komathuzaki, both of Ibaraki; Kenichi Chonan, Katsuta, and Kiyoshi Horibe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 22, 1981, Ser. No. 314,036

Claims priority, application Japan, Oct. 22, 1980, 55-148718

Int. Cl.³ F15B *13/044*

U.S. Cl. 91—454 **8 Claims**



1. A vacuum actuator comprising:

a diaphragm chamber defined between a diaphragm and an acutator case means for housing said diaphragm;

an actuator rod means for transferring a displacement of said diaphragm;

a valve member for controlling a communication of vacuum with said diaphragm chamber;

solenoid means for actuating said valve member, said solenoid means being mounted on an outer surface of said actuator case and includan annular solenoid coil, a plunger means for displacing said valve member under an electromagnetic force caused by said solenoid coil and a cylindrical case means made of magnetic material for receiving said solenoid coil;

a valve case means for forming a part of a vacuum passage and for housing said valve member therein, said valve case means comprises a first valve chamber housing said valve

member, a vacuum inlet port for introducing vacuum to said first valve chamber, an atmosphere inlet port opening at an opposite side of said first valve chamber from said valve inlet port for introducing atmosphere to said first valve chamber, a second valve chamber housing a second valve member, a communication passage between said first valve chamber and said second valve chamber, and a vacuum outlet nipple for introducing vacuum from said second valve chamber to said diaphragm;

means for releasably securing said solenoid means to said actuator case means in such a manner that an outer surface of said cylindrical case means of said solenoid means is in contact with an outer surface of said actuator case means and said valve case means is disposed on said outer surface so as to enable a completion of said vacuum passage; and

wherein said solenoid means comprises a first solenoid portion secured to said valve case means for selectively controlling the first mentioned valve member to open and close the vacuum inlet port, and a second solenoid portion secured to said valve case means for selectively controlling said second valve member to open and close said vacuum outlet nipple.

4,515,067

ADJUSTABLE AXIAL PISTON MACHINES

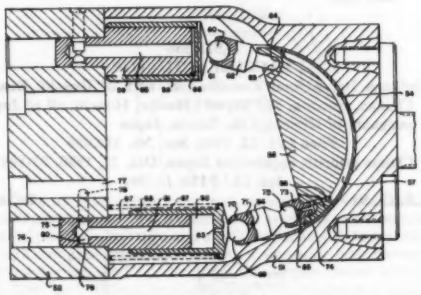
Walter Heyl, Johannesberg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Weisbaden, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 414,668

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135605

Int. Cl.³ F01B *13/04*

U.S. Cl. 91—506 **2 Claims**



1. An adjustable axial piston machine comprising a housing, a source of high pressure fluid, an adjusting mechanism in said housing consisting of at least one operating cylinder that is connected with said high pressure source, a servo piston capable of sliding in said cylinder, a revolving cylindrical drum having cylindrical bores in said housing, working pistons in said bores capable of sliding therein, a swash plate in supporting connection with said pistons, said swash plate being formed on a rocker body which is in operating connection with the adjusting mechanism and has a semi-cylindrical support surface, a hollow-cylindrical bearing surface in the housing against which said semi-cylindrical surface bears, a pressure pocket recess connected with said high pressure source located in one of said surfaces and being loaded with pressure medium from the high pressure source through channels effected in the rocker body, the connection between the high pressure source and the pressure pocket recess being provided through the operating cylinder pressure chambers and the servo pistons, and wherein the operating cylinder is guided coaxially and in a displaceable manner on the servo piston which is rigidly connected with the housing, and wherein the operating cylinder is supported through a ball-and-socket joint against an intermediate element, which is in turn supported through a ball-and-socket joint against the rocker body and, in which boreholes connected with each other and with the channel in the rocker body are located in the servo piston, operating cylinder and in the intermediate element and in the ball-and-socket joints.

4,515,068

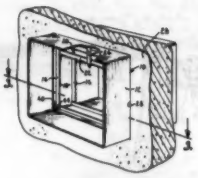
DAMPER WITH INTEGRAL MOUNTING MEANS

Robert M. Van Becelaere, Johnson County, Kans., assignor to Ruskin Manufacturing Company, Grandview, Mo.

Filed Jun. 1, 1983, Ser. No. 500,285

Int. Cl.³ F24F *7/00*

U.S. Cl. 98—1 **1 Claim**



1. A fire damper for ready installation in a wall opening in condition to resist dislodgement by forces applied against the damper closure, said damper comprising:

a peripherally extending damper frame of sheet material adapted to fit within a wall opening in facing relationship to the wall, said frame being provided with a plurality of peripherally spaced apart apertures;

a damper closure carried by the frame and movable from a standby position permitting flow of fluids through the damper to a closed position resisting said flow;

a tubular element for each aperture respectively, each element being rigidly secured to the frame and projecting inwardly therefrom, each element being provided with a threaded bore; and

an elongated, threaded stud for each element, each stud being telescoped in its respective element bore in threaded engagement therewith, the outwardly projecting end of each stud being substantially conical and having a cutting edge adapted to cut a hole for the stud when the latter is rotated on its longitudinal axis, the opposite end of each study being provided with a tool engageable head, whereby the respective studs may be advanced into projected relationship from the frame and into holes bored in the wall by the studs upon manual rotation of the respective studs on their longitudinal axes, to firmly secure the damper in the wall opening.

4,515,069

CHANGE-OVER DIFFUSER

James R. Kline, Moraga, and Peter Brand, San Francisco, both of Calif., assignors to Acutherm, Ltd., Emeryville, Calif.

Filed Jan. 20, 1984, Ser. No. 572,688

Int. Cl.³ F24F *13/072*

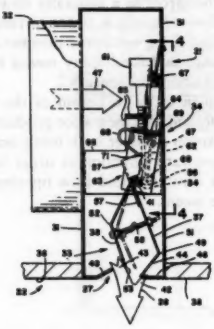
U.S. Cl. 98—40 D **4 Claims**

1. A change-over diffuser including a housing formed for coupling to air supply means and formed with outlet means for

discharge of air therefrom, blade means movably mounted with respect to said housing, and blade displacement means coupled to said blade means for displacement of said blade means between a first position and a second position for control of air discharged from said outlet means, wherein the improvement in said change-over diffuser comprises:

said blade displacement means being provided as an expansible thermal sensor-actuator element coupled to drive said blade means and being positioned inside said housing for displacement of said blade means in response to the temperature of the air supplied to said housing;

said blade means being formed for the discharge of air from



said outlet means when said blade is in said first position at a first angle of discharge;

said blade means being formed for the discharge of air from said outlet means when said blade means is in said second position at a second angle of discharge angularly displaced from said first angle of discharge; and

said displacement means further includes a snap-acting assembly coupled between said thermal sensor-actuator element and said blade means and formed for snap-acting displacement of said blade means between said first position and said second position in response to expansion and contraction of said thermal sensor-actuator element upon changes of temperature in said housing.

4,515,070

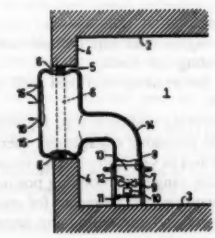
VENTILATION METHOD AND APPARATUS

Olle Bobjer, Carl Barks väg 3, S-163 58 SPånga, Sweden; Torsten Dahlin, Jose Almeida Camargo 103, Sao Paulo SP CEP05436, Brazil, and John Grieves, G:a Lundagatan 6 A, S-117 26 Stockholm, Sweden

Filed Jun. 16, 1983, Ser. No. 505,128

Int. Cl.³ F24F *7/06*

U.S. Cl. 98—42.07 **5 Claims**



1. A method for temporary ventilation of a room through an existing wall opening, said method comprising the step of:

blowing room air through a self-sustained sealing inflatable balloon installed in the existing wall opening wherein the exit of the blown air from the balloon takes place under a sufficient resistance to build an overpressure sufficient to inflate the balloon and maintain the balloon in self-sustained sealing connection with the existing wall opening.

4,515,071

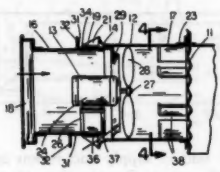
VENTILATION AIR CONTROL UNIT

Elmer S. Zach, R.R. #2, Box 118, Humphrey, Nebr. 68642

Continuation-in-part of Ser. No. 365,113, Apr. 5, 1982, abandoned. This application Sep. 23, 1982, Ser. No. 422,068

Int. Cl.³ E04H *7/00;* **F04D** *29/52*

U.S. Cl. 98—55 **8 Claims**



1. An improved ventilation air control unit of the type having a pneumatic pathway and a fan and motor unit disposed within said pneumatic pathway for causing air to be moved therethrough, the improvement comprising:

(a) forming said pneumatic pathway of two tubes connected together, the first of said tubes having an interior diameter that is smaller than the interior diameter of the second of said tubes;

(b) positioning said fan blade and motor unit such that said fan blade may rotate within said second tube; and

(c) a supplemental feed unit for reducing air slippage around the fan blade that includes:

(i) a substantially annularly shaped flange disposed within said pneumatic pathway upstream of and proximal to said fan blade;

(ii) at least one pneumatic port unit disposed through said pneumatic pathway upstream of said annularly shaped flange; and

(iii) at least one air flow augmentation scoop disposed on the interior wall of said pneumatic pathway under each of said port units, whereby air from the pneumatic pathway interior flows from said scoops through said ports in said pneumatic pathway wall to the exterior of said ventilation air control unit and back into the interior through the larger diameter tube.

3. The improved ventilation air control unit of claim **1** wherein said pneumatic pathway pneumatically connects to a grain drying bin.

4,515,072

SPRAYBOOTH

Eric H. Crisp, Colchester, England, assignor to Spraybake Limited, England

Filed Nov. 24, 1982, Ser. No. 444,094

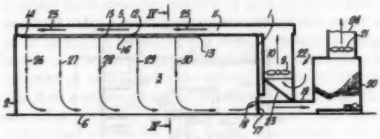
Claims priority, application United Kingdom, Dec. 14, 1981, 8137625

Int. Cl.³ B05C *15/00*

U.S. Cl. 98—115.2 **12 Claims**

1. In a spraybooth for use in spray painting motor vehicles, said spraybooth including first and second side walls, first and second end walls, a top, vehicle access doors and means mounting said access doors in said second end wall, the improvement comprising an air supply and extraction system comprising air supply duct means which extends substantially centrally along the length of said top and is spaced from said first and second side walls, means defining at least one air supply opening in said air supply duct means, and filter means fitted to said at least one opening for suplying air downwardly,

said filter means extending from a position at or adjacent said first end wall to a position at or adjacent said second end wall, means defining at least one air outlet opening only in the bottom of said first end wall, air extraction means connected to said at least one air outlet opening for extracting air from said spraybooth through said at least one outlet opening, blower means for causing air to flow through said air supply duct means only in a direction from said first end wall towards said second end wall of said spraybooth, and air heater means for heating said air caused to flow through said air supply duct means, whereby, in operation, the velocity head of the air



flowing through said air supply duct means decreases and the pressure head of said air flowing through said duct means increases along the whole length of said filter means in a direction from said first end wall towards said second end wall, and the downward air flow from said filter means per unit length of said air supply duct means increases in a direction from said first end wall towards said second end wall of said booth, such that an extremely efficient downward air flow pattern in the spraybooth is achieved with little or no turbulence, whereby, after spraying, droplets of paint with which the air in the spraybooth is contaminated after spraying are not precipitated on the surface of the motor vehicle which has been sprayed.

4,515,073

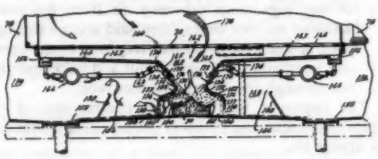
AIR SCRUBBING SYSTEM

Robert Dorsch, Warren, and Arnold J. Matusz, West Bloomfield, both of Mich., assignors to Alpha-Debon Industries, Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 399,430, Jul. 19, 1982, abandoned. This application Jun. 16, 1983, Ser. No. 505,088

Int. Cl.³ B05C *15/00*

U.S. Cl. 98—115.2 **24 Claims**



5. In an apparatus for removing particulate matter from contaminated air, said contaminated air flowing from a chamber through a perforate floor of said chamber, the improvement comprising:

a sub-floor beneath at least a portion of said perforate floor, means for flooding said sub-floor with a flowing fluid to a depth sufficient to substantially prevent the accumulation of said particulate matter on said sub-floor as said contaminated air flows through said perforate floor, a flow opening in said sub-floor for receiving said contaminated air flowing therethrough;

means for producing a fluid spray;

means for merging said flowing sub-floor fluid with said fluid spray to form a combined fluid spray;

conduit means communicating with said flow opening for passing said contaminated air through said combined fluid spray in order to remove said particulate matter from said contaminated air, said conduit means including

baffle means in said conduit means for directing said combined fluid spray along a generally serpentine fluid flow path and for directing said contaminated air along a generally serpentine air flow path so that said contaminated air passes through said combined fluid spray at least twice as it flows through said conduit means; and

fluid collection means for collecting said combined fluid spray after said contaminated air has passed therethrough and for draining said combined fluid spray from said conduit means;

said fluid spray means, said conduit means and said fluid collection means all being located beneath the elevation of said sub-floor, and said sub-floor including an apron member extending therefrom in a generally downward direction into said flow opening in order to flowingly direct said sub-floor fluid along said apron member and then into said flow opening, said fluid spray means being located beneath said sub-floor and beneath

said apron portion in order to be out of the flow of said contaminated air, and said means for producing said fluid spray and said apron member both being oriented generally in said downward direction in order to direct said combined spray flow into said flow opening to impinge upon said baffle means.

4,515,074

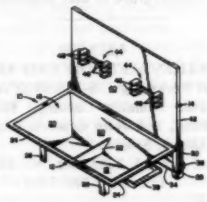
BARBECUE COOKING UNIT

Kjeld K. Iverson, R.R. 1, Pender Island, British Columbia, Canada V0N 2M0

Filed May 3, 1984, Ser. No. 606,677

Int. Cl.³ A47J *37/07*

U.S. Cl. 99—393 **4 Claims**



1. A barbecue cooking unit, comprising:

a. a coal well having an open top, defined within a bottom wall and upstanding side walls;

b. support means for securing said coal well in a generally upright position;

c. lid means for covering said open top, depending from said support means in pivotable engagement therewith from a closure position and in vertically sliding receipt therewith over an adjustable range in a cooking position; and,

d. grill support means on said lid means for receiving perforate grill members and presenting the same at a preselected height over said open top;

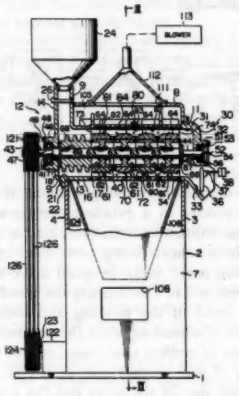
wherein said lid means is selectively pivotable into sealing engagement with said coal well for extinguishing coals contained therein when in said closure position and is selectively slideable over said range to present said grill support means at a desired vertical level over said coal well when in said cooking position.

4,515,075

RICE POLISHING MACHINE

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co. Ltd., Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,807
Claims priority, application Japan, Jul. 15, 1983, 58-129786
Int. Cl.[3] B02B 3/00, 7/02
U.S. Cl. 99—519 12 Claims



1. A machine for polishing rice grains comprising,

a frame;

a shaft supported by said frame for rotation about an axis generally extending horizontally;

a polishing roll mounted on said shaft for rotation therewith;

a perforated cylindrical polishing assembly mounted in substantially concentric relation to said axis, said perforated cylindrical polishing assembly cooperating with said polishing roll to define a polishing chamber between an outer circumferential surface of said polishing roll and an inner circumferential surface of said perforated cylindrical polishing assembly, said polishing chamber having an inlet and an outlet;

supply means communicating with said inlet of said polishing chamber for supplying rice grains to be polished into said polishing chamber;

drive means drivingly connected to said shaft for rotating said shaft to rotate said polishing roll relative to said perforated cylindrical polishing assembly, to thereby polish the rice grains within said polishing chamber, to remove a surface bran layer from each of the rice grains, the polished rice grains being discharged from said polishing chamber through said outlet thereof;

partition wall means engaging with an outer circumferential surface of said perforated cylindrical polishing assembly at a location below said axis of said shaft, for dividing said outer circumferential surface into an arcuate bottom surface section and the remaining arcuate surface section and for defining a lower space to which said arcuate bottom surface section is exposed and an upper space to which said remaining arcuate surface section is exposed; and

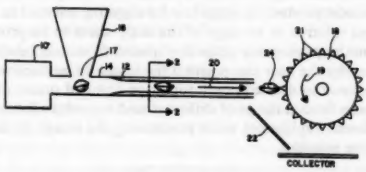
air flow means for causing air to flow from said lower space into said polishing chamber through apertures in said arcuate bottom surface section of said perforated cylindrical polishing assembly and then to flow from said polishing chamber into said upper space through apertures in said remaining arcuate surface section of said perforated cylindrical polishing assembly, the air flow from the lower space into the polishing chamber through the apertures in the arcuate bottom surface section of the perforated cylindrical polishing assembly being higher in velocity than that of the air flow from the polishing chamber into the upper space through the apertures in the remaining arcuate surface section of the perforated cylindrical polishing assembly, to thereby impart an upward force to the rice grains within the bottom portion of said polishing chamber.

4,515,076

APPARATUS FOR CRACKING AND SEPARATING NUTS

David Reznik, 375 Coleridge, Palo Alto, Calif. 94301

Filed Jun. 22, 1983, Ser. No. 506,682
Int. Cl.[3] A23N 5/00
U.S. Cl. 99—571 13 Claims



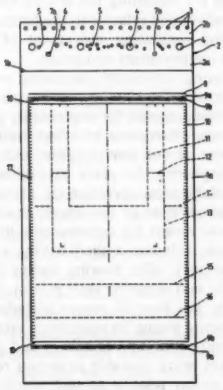
1. Apparatus for cracking walnut halves having an edge defining an open bottom, comprising a tube through which the walnut halves are propelled, said tube having a first cross-section dimension which will pass the halves in a desired orientation, and a second cross-section dimension orthogonal to and less than the first cross-section dimension, and means for applying sufficient force along the second cross-sectional dimension to crack the walnut halves, the desired orientation being such that the open bottom faces away from the force applying means and the first and second dimensions of said tube being such that the edges of the walnut halves rest on said tube during application of force by said force applying means.

4,515,077

DUPLICATING STENCIL

Lewis Davidson, Woodford Green; Brian Lees, Hertfordshire, and Eric K. Lytra, Enfield, all of England, assignors to Gestetner Manufacturing Limited, London, England

Filed Jul. 19, 1983, Ser. No. 515,151
Claims priority, application United Kingdom, Jul. 22, 1982, 8221249; Nov. 2, 1982, 8231257
Int. Cl.[3] B41N 1/24
U.S. Cl. 101—127 12 Claims



1. A duplicating stencil for use on more than one type of duplicator, comprising: a sheet of limp stencil material having first and second edges; printed markings on said sheet to assist the user in positioning the image correctly on the stencil based

upon the size of a paper sheet to which the image is to be transferred during duplication; a stencil heading strip attached along said first edge of said sheet and defined as first and second heading strip regions separated by an intended line of separation of the heading strip regions, said first and second heading strip regions each having a plurality of differently configured apertures defining a respective array of mounting holes in each of said regions for mounting said stencil on any of several duplicators having different mounting post configurations and patterns, said intended line of separation being parallel to and spaced from said first edge of the limp sheet; said printed markings defining a plurality of image fields having a common printed top edge line for aligning material to be duplicated relative to an edge of the copy sheet to be printed, said common printed top edge line spaced from said heading strip, whereby the user can position the image to be duplicated with reference to said common top edge line and does not need to choose from a range of different said top edges for respective different duplicators when positioning the image on the stencil before printing.

4,515,078

DOCTOR BLADE DRIVE

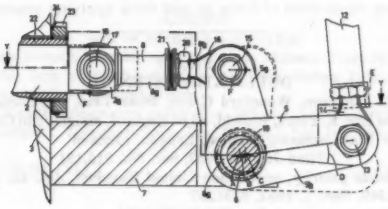
Kurt Difflipp, Dietzenbach, and Johannes Wanke, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,272

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220845

Int. Cl.³ B41F *9/10*

U.S. Cl. 101—157 **12 Claims**



1. In a printing press having a form cylinder and a doctor blade, means for mounting the doctor blade for longitudinal oscillatory movement relative to the form cylinder, and means for generating oscillating movement of said doctor blade wherein the improvement comprises:

said oscillating movement generating means includes a pivotably mounted rocker, means coupling the rocker to the doctor blade, means for sequentially pivoting said rocker in opposite directions to effect oscillation longitudinal movement of said doctor blade, and means for continuously displacing the pivot axis of said rocker independently of the press operation for continuously varying the points of reversal of the doctor blade oscillating movement, said means for continuously displacing the rocker pivot axis including a shaft having an eccentric section, first one way idler bearing means for supporting said rocker on said eccentric shaft portion for rotation about an eccentric axis thereof, means including second one way idler bearing means for supporting said shaft for rotational movement about a pivot axis of said shaft, said first bearing means being operable to permit rotational movement of said rocker relative to said eccentric shaft portion in one direction while said second bearing means blocks rotational movement of said shaft in such direction about said pivot axis, and said second bearing means being operable to permit rotational movement of said shaft about said pivot axis in an opposite direction while said first bearing means blocks rotational movement of said rocker relative to said eccentric shaft portion in such direction.

4,515,079

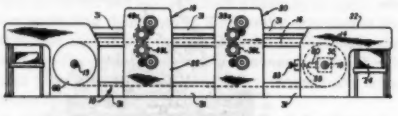
PLANETARY SYNCHRONIZING DEVICE

Harold P. Dahlgren, 11 Turtle Creek Bend, Dallas, Tex. 75204

Filed Mar. 9, 1983, Ser. No. 473,852

Int. Cl.³ B41F *21/08*; B41L *21/10*

U.S. Cl. 101—183 **3 Claims**



1. In a device for moving a sheet of paper relative to a printing cylinder in a printing press comprising a printing cylinder; an impression cylinder; a pair of drive wheels, one of the said drive wheels being positioned adjacent each side of said printing press; variable speed drive means to rotate said drive wheels and to synchronize the speed of the drive wheels with the speed of the printing and impression cylinders; a second pair of wheels adjacent the opposite end of the printing press; a pair of endless steel tapes, one of said tapes extending about one of said second pair of wheels and a drive wheel adjacent one side of the press and the other of said tapes extending about a drive wheel and another of said second pair of wheels adjacent the opposite side of the printing press; gripper bars secured to and extending between said tapes, spacing between the second wheel and drive wheel adjacent each side of the press being adjustable for adjusting tension in the tapes, the improvement comprising: said second pair of wheels being idler wheels; means supporting said idler wheels such that the idler wheels are driven by the tapes and each idler wheel is rotatable independently of the other idler wheel and independently of the drive wheels; positive adjusting means for adjusting the position of the idler wheels such that a change in temperature of said tapes will result in a change in tension in said tapes but not a change in the length of said tapes, said adjustment means being adapted for independent adjustment of the length of each of said tapes for changing the length of the distance between gripper bars on each of said tapes.

4,515,080

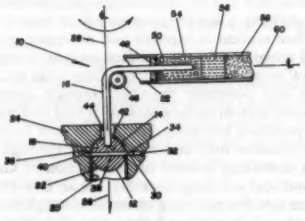
INERTIA TYPE FRICTION INITIATOR FOR ROTATING PROJECTILES

Frank H. Bell, Logan, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Dec. 27, 1982, Ser. No. 453,317

Int. Cl.³ F42C *19/08*

U.S. Cl. 102—205 **6 Claims**



1. An inertia type friction initiator for a rotating projectile having a central axis comprising,

a cable having a first end and a second end, and having a first

portion adjacent said first end and a second portion adjacent said second end,

a mass means,

cavity forming means providing a cylindrical cavity having a narrowed opening at one end, a shoulder around said opening for supporting said mass means in said cavity, and having a longitudinal axis that is in substantial parallel alignment with the central axis of the projectile,

a shear pin extending through said mass means and at least a portion of said cylindrical cavity forming means to retain said mass means against said shoulder,

sleeve forming means providing a sleeve having a longitudinal axis that is positioned transversely of the longitudinal axis of said cylindrical cavity and is displaced axially of said cavity in a direction opposite the direction of movement of the projectile when launched for flight, said sleeve having a keeper-washer therein, a shoulder against one side of which said keeper-washer is in engagement and on the other side of which there is provided friction initiating means, said keeper-washer and shoulder each having an opening therein,

said cable having said first end extending through the narrowed opening in said cavity and fixedly attached to said mass means, said cable for said first portion extending in a direction that is substantially parallel to the central axis of the projectile, said direction being opposite to the direction of movement of the projectile when launched for flight, and

said cable having said second end thereof extending through the opening in the keeper-washer and shoulder in said sleeve into physical contact with said friction initiating means, said cable being affixed to said keeper-washer, and

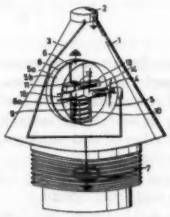
means for guiding said second portion of said cable in a direction transversely of the central axis of the projectile.

4,515,081

ARRANGEMENT IN A FUSE FOR PROJECTILES WITH EXPLOSIVE CHARGE FOR CHANGING OVER BETWEEN DIRECT AND DELAYED IGNITION OF THE EXPLOSIVE CHARGE

Kenneth Sundvall, Eskilstuna, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Nov. 16, 1982, Ser. No. 442,155
Claims priority, application Sweden, Nov. 16, 1981, 8106780
Int. Cl.³ F42C *9/00*
U.S. Cl. 102—266 **4 Claims**



1. A fuse for an ignitor circuit of a projectile having an explosive charge, said ignitor circuit being changeable by said fuse between a direct and delayed ignition of said explosive charge, said fuse comprising:

a body being electrically conducting,

a cavity defined by said body,

a housing mounted in said cavity, said housing being electrically insulating,

a first channel defined by said housing, said first channel extending parallel to a longitudinal axis of said body,

means defining an electrically conductive path and a tongue, said means being located in said housing,

a power source having one pole for electrical connection to said igniter circuit and said means and an opposite pole electrically connected to said body,

an electrical contact member slidingly mounted in said first channel and electrically contacting said contact means, said electrical contact member being biased for engagement with said body, the electrical contact member being movable in the first channel under accelerational forces effected on the fuse for moving from an initial position contacting the body and short-circuiting the electrical ignitor circuit to a second position where the electrical contact member interrupts the short-circuit of the electrical ignitor circuit by engaging said tongue,

spring means for biasing said electrical contact member into electrical contact with said body,

a second channel defined by said housing located transversely to said first channel, and

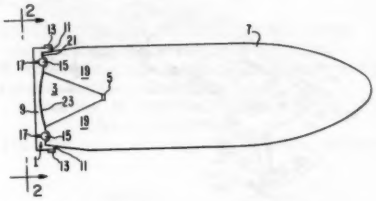
locking means slidable in said second channel between two positions, one position prevents said electrical contact member from being restrained from electric contact with said body for short-circuiting the electrical ignitor circuit and the other position permits said electrical contact member to be restrained from electric contact with said body and interrupting the short-circuiting of the electrical ignitor circuit.

4,515,082

GUIDED PROJECTILE LENS COVER

Vito F. Pizzurro, Villa Park, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 22, 1983, Ser. No. 534,852
Int. Cl.³ F42B *13/16*
U.S. Cl. 102—293 **4 Claims**



1. A soft cover for protectively covering a rearward-looking lens of a guided projectile fired from a barrel, comprising:

a substantially planar soft plate that covers an exposed rear surface of the lens; and

formed within the soft plate, a vacated toroidal chamber that receives gases of combustion during the firing of the projectile from its barrel; wherein

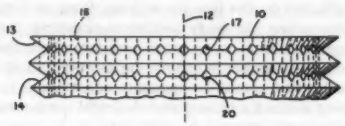
the soft plate has many small holes coupling a rear surface of the soft plate to the chamber, for admitting gases of combustion into the chamber during firing;

the shape of the chamber in the plane of the soft plate is a circular band surrounding and spaced apart from the lens;

the chamber is separated from a substantially planar rear surface of the projectile by a thin portion of soft cover generally in the shape of a circular band; and

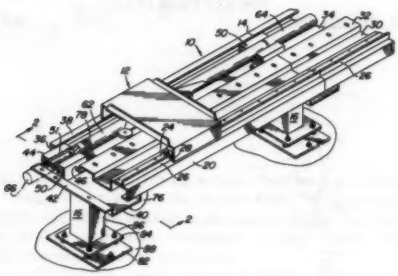
the difference between the gas pressure within the chamber and the gas pressure outside the soft plate subsequent to the projectile's leaving its barrel causes the soft cover to be removed from the lens.

4,515,083
ANTI-PERSONNEL FRAGMENTATION LINER
Anthony M. Caruso, 1620 Dallas St., Aurora, Colo. 80010
Filed Jan. 27, 1983, Ser. No. 461,509
Int. Cl.³ F42B 27/00, 13/48
U.S. Cl. 102—493 6 Claims



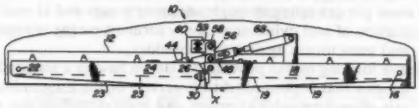
6. A structure for producing anti-personnel fragments comprising a liner, said liner having an inner surface and an outer surface, a plurality of grooves formed in the inner surface thereof, and a plurality of grooves formed in the outer surface thereof, said grooves being angularly oriented with respect to each other in order to establish a plurality of points of mutual intersection, said grooves being sufficiently deep to form an aperture in said liner at said mutual intersection points in order to produce an anti-persoinnel fragment of predetermined size and shape.

4,515,084
TRACK FOR DRIVERLESS VEHICLES
Charles E. Jacoby, Bethleham, assignor to SI Handling Systems, Inc., Easton, Pa.
Filed Dec. 7, 1981, Ser. No. 328,282
Int. Cl.³ B61B 13/12
U.S. Cl. 104—166 10 Claims



1. A track for a driverless vehicle comprising a horizontally disposed integral sheet metal track structure having a low profile and shaped to have first and second rails on a top surface thereof along opposite sides thereof for supporting a driverless vehicle disposed entirely above said track structure, said track structure being a plurality of sheet metal members arranged end to end, said first rail being a discrete longitudinally extending drive shaft supported by cylindrical bearings on said track structure and adapted for frictional contact with a drive wheel on one side of a driverless vehicle, said second rail being a horizontally disposed surface which is an integral portion of said track structure and adapted to be in rolling contact with a support wheel on the other side of a driverless vehicle, motor means supported by said track structure and connected to said shaft for rotating said shaft about its longitudinal axis, the top surface of said second rail lying in a generally horizontal plane which is tangent to said shaft at the 12 o'clock position thereof, and said shaft being both a drive and a rail for a driverless vehicle.

4,515,085
SPEED CONTROL APPARATUS
Peter H. Rohrbach, Bath, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.
Filed Jul. 15, 1983, Ser. No. 514,123
Int. Cl.³ B61K 7/02
U.S. Cl. 104—250 13 Claims



1. Apparatus for controlling the angular position of a drive wheel for a driverless vehicle comprising first and second speed control devices supported for pivotable movement between a first position wherein said first device is adapted to cause deceleration movement of a drive wheel and a second position wherein said second device is adapted to allow acceleration movement of a drive wheel, motor means coupled to said devices for moving said devices between said positions, and means associated with said devices so that said devices move rapidly toward said second position by said motor means for the initial part of their movement and then move slowly for the remainder of their movement.

4,515,086
ADJUSTABLE WORD PROCESSOR WORK STATION
Alfred Kwiecinski, and Jon A. Yauger, both of Fairfield, Ohio, assignors to Hamilton Sorter Company, Inc., Fairfield, Ohio
Filed Apr. 21, 1982, Ser. No. 370,467
Int. Cl.³ A47B 57/00
U.S. Cl. 108—96 14 Claims

1. A work station for a word processor having a keyboard and a separate console, said work station comprising:

a planar general rectangular work surface;

a front opening in said work surface extending inwardly from the front edge of said work surface intermediate the opposite ends thereof;

a front platform of a size to mount a keyboard thereon received within said front opening;

means for raising and lowering said front platform relative to said work surface;

a rear opening in said work surface extending inwardly from the rear edge thereof intermediate the opposite ends thereof, said rear opening terminating short of said front opening;

a rear platform of a size to be received within said rear opening, said rear platform being adapted to mount a console thereon;

means for raising and lowering said rear platform relative to said front opening, means in association with said rear platform for moving a console mounted thereon forwardly and rearwardly relative to said rear platform, means in association with said rear platform for rotating a console mounted thereon in a horizontal plane relative to

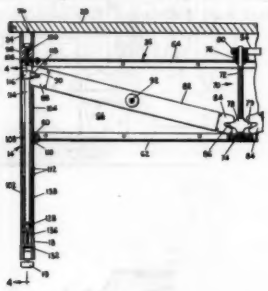
said rear platform, and means in association with said rear platform for tilting said rear platform about a horizontal axis, whereby the front and rear platforms may be independently adjusted relative to said planar work surface to thereby adjust the relative positions of the keyboard and console of a word processor.

4,515,087

HEIGHT ADJUSTABLE TABLE

Andrew J. Kurrasch, Saugatuck, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Feb. 17, 1983, Ser. No. 467,245
Int. Cl.³ A47B 9/00
U.S. Cl. 108—147 **14 Claims**



1. A table with a vertically movable top surface, said table comprising:

a work surface;

at least two legs, each of which has a stationary member and a movable member adapted to move vertically with respect to said stationary member;

means securing the work surface to said legs movable members;

at least two levers pivotably mounted to one of said stationary and movable members of said legs, each of said levers having at one end thereof a leg engagement means to engage the other of said movable and stationary members of one of said legs and having at the other end thereof drive engagement means;

a drive means mounted to the one of said stationary and movable members and adapted to vertically drive said drive engagement means on the other ends of said levers, said drive means including a driven shaft, means for rotating said driven shaft, and a nut mounted for travel along the driven shaft and engagable with said levers;

the improvement which comprises:

an enlarged diameter on said nut and said levers drive engagement means comprising recesses for receiving said enlarged diameter on said nut so as to operatively connect said nut to said levers, said enlarged diameter and recesses allowing for hinge-like movement of said levers relative to said nut during rotation of said lever;

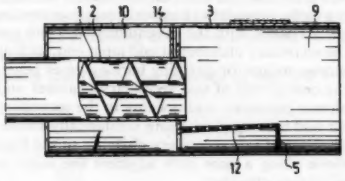
whereby rotation of said drive shaft results in vertical movement of said nut and results in a corresponding vertical movement of said work surface with respect to said legs stationary members.

4,515,088

BURNER FOR PELLETS

Markku Orjala, Jyväskylä, Finland, assignor to Valtion Teknillinen Tutkimuskeskus, Finland

PCT No. PCT/FI82/00055, § 371 Date Jun. 27, 1983, § 102(e) Date Jun. 27, 1983, PCT Pub. No. WO83/01671, PCT Pub. Date May 11, 1983
PCT Filed Nov. 3, 1982, Ser. No. 515,048
Claims priority, application Finland, Nov. 5, 1981, 813487
Int. Cl.³ F23K 3/14
U.S. Cl. 110—110 **3 Claims**



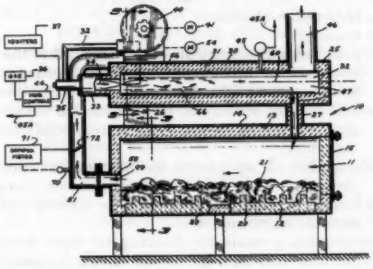
1. A burner for the combustion of granular fuels, comprising an inner tube, an outer tube spaced outwardly of the inner tube with the space between said tubes defining an air supply chamber, the outer end of the outer tube projecting beyond the inner end of the inner tube and the projecting end of the outer tube defining a combustion chamber, a flange connecting the outer end of the inner tube to said outer tube and separating said air supply chamber from said combustion chamber, a grate disposed within the lower end of the combustion chamber, the lower end of said flange having at least one hole providing communication between the said supply chamber and said grate, the upper portion of said grate having a plurality of openings whereby air flows upwardly from the grate into the combustion chamber, and air distribution means in the upper end of said flange for delivering air from said air supply chamber to said combustion chamber in a swirling pattern.

4,515,089

INCINERATOR HAVING KINETIC VENTURI ISOTHERMIC GRID BURNER SYSTEM

Merlin W. Ehrlichmann, Alexandria, Minn., assignor to Sunburst Laboratories, Inc., Minneapolis, Minn.

Filed Feb. 23, 1984, Ser. No. 583,046
Int. Cl.³ F23B 5/00
U.S. Cl. 110—235 **10 Claims**



1. An incinerator assembly for burning organic materials comprising a first housing defining a main burning chamber having a first end and a second end;

an outlet port defined in a second end of said main burning chamber;

a second housing defining a secondary chamber, said second

housing having an input end and a distal end, said secondary chamber having a substantially circular cross section and being elongated along a longitudinal central axis;

conduit means leading from the outlet port of said main burning chamber;

and effluent gas blower having an inlet connected to said conduit means, and a blower outlet opening to said secondary chamber, said blower outlet having an outlet opening central axis positioned generally perpendicular to the longitudinal axis of said secondary chamber, said blower outlet opening to the secondary chamber adjacent the input end of said secondary chamber;

a burner member mounted on said second housing and opening to the secondary chamber through an opening substantially coaxial with the longitudinal axis and opening into the secondary chamber at said input end, including burner blower means for directing burning gases generally along the central axis of said secondary chamber under burner blower pressures, said opening to the secondary chamber for said burning gases being substantially smaller than the diameter of said secondary chamber so the burning gases move along a core path adjacent the input end of the secondary chamber;

said blower outlet opening being on a lateral side of the second housing, the blower outlet opening central axis being laterally offset from the longitudinal central axis, the blower outlet opening being defined by surface means including a surface portion that is oblique with respect to the blower outlet opening central axis for directing a portion of the flow through the blower outlet opening to cross the longitudinal central axis, and intermix by moving unsymetrically across the core path with respect to the longitudinal axis;

a pipe connection at the distal end of said secondary chamber opening into said main burning chamber adjacent the first end thereof to form a circulation path when the effluent gas blower is operating; and

means to control combustion rate of said burner to maintain burning in the secondary chamber and substantially completely burn combustible materials in the effluent gases as the effluent gases move along the secondary chamber from the input end to the distal end thereof.

4,515,090

SOLID FUEL BURNER

David F. Brashears, Oviedo, and Joseph T. Mollick, Longwood, both of Fla., assignors to Mechtron International Corp., Orlando, Fla.

Filed Dec. 12, 1983, Ser. No. 560,439

Int. Cl.³ F23C *1/10*; F23K *5/00*

U.S. Cl. 110—264 **5 Claims**

1. A solid fuel burner comprising in combination:

a combustion chamber;

a housing;

a solid fuel and primary air nozzle attached to the combustion chamber through the housing for directing pulverized solid fuel and primary air to the combustion chamber;

a solid fuel and primary air input connected to the solid fuel and primary air nozzle for directing solid fuel and air thereinto;

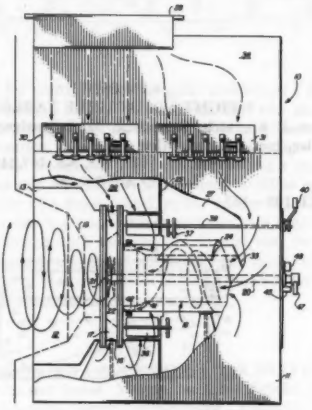
a secondary air input means for directing air under pressure through said housing into said combustion chamber;

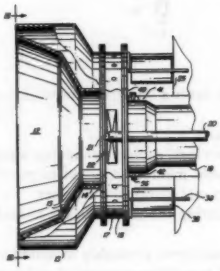
a housing dividing means dividing the housing into first and second compartments;

proportioning means for directing the input secondary air between said housing first and second compartments, the first compartment directing air into said combustion around said solid fuel and primary air nozzle and the second compartment directing air through said solid fuel and primary air nozzle and around said solid fuel and primary nozzle, said proportioning means including a plurality of adjustable dampers for directing predetermined proportions of secondary air between said first and second housing compartments whereby a two zoned secondary air control may be used in adjusting the flame of a solid fuel burner;

a plurality of registers located in said solid fuel burner for directing the secondary air from said housing first compartment to said combustion chamber in one direction of rotation;

a plurality of vanes located in said housing around said solid fuel and primary air nozzle for directing a portion of the secondary air from said second compartment into said combustion chamber in a second direction of rotation;





a solid fuel and primary air diffuser mounted at the output of said solid fuel and primary air nozzle for rotating solid fuel and air passing through said solid fuel and primary air nozzle in said second direction of rotation and an air cooled annular shaped metal conduction barrier having a plurality of apertures therein mounted to said combustion chamber adjacent the inlet of secondary and primary air into said combustion chamber, whereby said conduction barrier is air cooled by the incoming air.

4,515,091

METHOD OF REMOVING PLASTIC RESIDUES IN MIXING APPARATUSES AND MOLDING TOOLS

Klaus Schlueter, 1 c Windeckstrasse, 8000 Muenchen 70, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,622

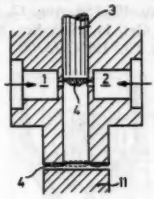
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231795

Int. Cl.³ F23G *3/00*

U.S. Cl. 110—346 **1 Claim**

1. A method for removing plastic residues in a mixing appa-

ratus or molding tool filled from such apparatus, wherein the plastic residues are heated and vaporized by means of a heated



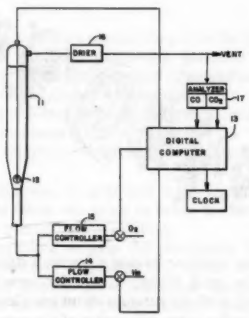
shaped part adapted to the shape of the component to which the said residues adhere.

4,515,092

ENHANCEMENT OF SOLID FUEL COMBUSTION BY CATALYST DEPOSITED ON A SUBSTRATE

Dennis E. Walsh, Richboro, and Gary J. Green, Yardley, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 11, 1984, Ser. No. 569,816
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **9 Claims**



1. A method of burning solid fuel comprising:
depositing a catalyst which enhances combustion by impregnating a particulate refractory substrate;
contacting a solid fuel with said particulate refractory substrate; and
burning said fuel.

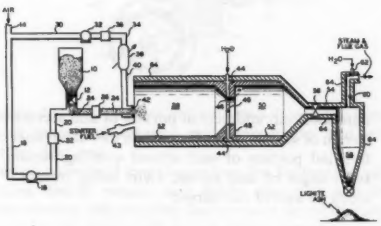
4,515,093

METHOD AND APPARATUS FOR THE RECOVERY OF HYDROCARBONS

David H. Beardmore, and Riley B. Needham, both c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Mar. 4, 1982, Ser. No. 354,564
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **18 Claims**

1. A method for generating steam by a high pressure, high intensity, or high heat release method of combustion in an elongated combustion zone having upstream and downstream ends on an intermediate location and utilizing a normally-solid, fuel which produces non-combustible solid residues, comprising:
(a) introducing said fuel axially into said upstream end of said elongated combustion zone;
(b) introducing a first volume of combustion-supporting gas into said upstream end of said combustion zone, as an annular, rotating stream about said fuel, in a manner to produce a rotating, toroidal vortex, of said fuel and said first volume of combustion-supporting gas, moving from said upstream end toward said downstream end of said combustion zone;
(c) said first volume of combustion-supporting gas being in an amount at least equal to the stoichiometric amount necessary for combustion of essentially all of the combustible portion of said fuel;
(d) said fuel and said first volume of combustion-supporting gas being introduced into and flowed through said combustion zone in a manner to collapse said vortex, at said intermediate location in said combustion zone, to produce an intimate mixture of said fuel and said first volume of combustion-supporting gas and produce plug-type flow through the remaining downstream portion of said combustion zone;
(e) burning said fuel in the presence of said first volume of



combustion-supporting gas while thus flowing the same through said combustion zone under conditions to produce a heat release rate of at least about 7 MM Btu/hr and a flue gas containing non-combustible solid residues of said fuel;
(f) abruptly terminating said burning of said fuel, adjacent said downstream end of said combustion zone, at least in part, by introducing water into said flue gas to form a mixture of said flue gas and said water;
(g) maintaining said mixture of flue gas and water in an vaporization zone, directly coupled to and in open communication with said downstream end of said combustion zone, for a time sufficient to vaporize a major portion of said water and produce a mixture of said flue gas and steam; and
(h) separating said solid residues from said mixture of flue gas and steam.

4,515,094

FUEL JET METHOD AND APPARATUS FOR PULVERIZED COAL BURNER

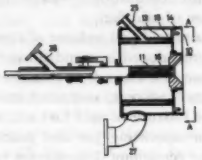
Shigeru Azuhata; Norio Arashi, both of Hitachi; Kiyoshi Narato, Ibaraki; Tooru Inada, Hitachi; Kenichi Souma, Hitachi; Keizou Ohtsuka, Hitachi; Yukio Hishinuma, Hitachi, and Tadahisa Masai, Kure, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,179
Claims priority, application Japan, Dec. 27, 1982, 57-226907
Int. Cl.³ F23K *5/00*
U.S. Cl. 110—347 **1 Claim**

1. A fuel jet method for a pulverized coal burner comprising the steps of:
(a) jetting a first coal in fine powder form with an air ratio of 0.1 to 0.3,
(b) jetting and swirling a second coal in a coarse powder form with an air ratio of 1 to 2 from a first outer circumferential portion of said first coal a first swirling of said second coal being performed in a swirl number, which is equal to momentum of the first swirling stream of said second coal per momentum toward a straight direction of said second coal, of 0.75 to 1.3, and a swirl angle of said

first swirl being from 45° to 90° along an axis of the burner, and

(c) jetting and swirling air from a second outer circumferential portion of said first swirling stream of said second coal, the speed of the second swirling of said air at an



outermost circumferential portion of said second swirling stream of said air being faster than that at an inner circumferential portion of said second swirling stream, and a swirl angle of said second swirl being from 45° to 90° along an axis of the burner.

4,515,095

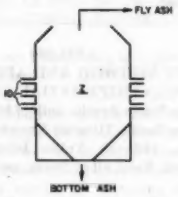
COMBUSTION OF COAL/WATER SLURRIES

Eugene J. Greskovich, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 585,796, Mar. 2, 1984, abandoned. This application May 1, 1984, Ser. No. 605,945

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **9 Claims**



1. A method for combusting coal/water slurries with oxygen enriched air in a furnace firebox which contains means for supplying a coal/water slurry, a primary airstream and a secondary airstream into the firebox, for the purpose of substantially complete combustion of the coal to CO_2 and H_2O;

(a) feeding a coal/water slurry into the furnace firebox along with the primary and secondary airstreams to yield a flame of combustion, and

(b) adding a sufficient amount of oxygen into the primary airstream, such that oxygen concentration of the air in the flame zone when the primary and secondary airstreams converge with the coal is greater than 21 up to 28 volume percent.

4,515,096

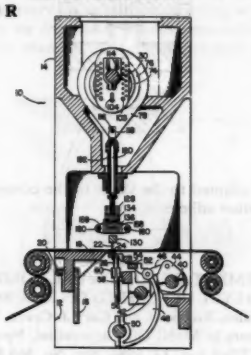
TUFTING MACHINES

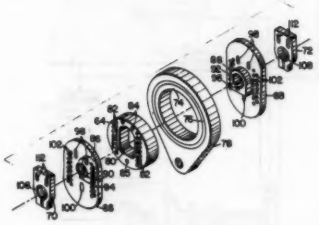
Gary L. Ingram, Ooltewah, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Continuation of Ser. No. 407,753, Aug. 13, 1982, abandoned. This application Oct. 11, 1983, Ser. No. 540,365

Int. Cl.³ D05C *15/00*

U.S. Cl. 112—79 R **23 Claims**



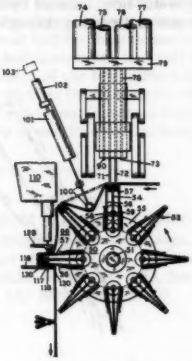


1. In a tufting machine having a frame, a drive shaft rotatably carried by said frame, a circular cam eccentrically mounted on said shaft for rotation about preselected rotational axes off-set from the geometric center of the cam, a connecting rod operably connected to said cam and driven thereby, a needle bar, means constrained for movement in a linear path connecting said needle bar to said connecting rod for reciprocation of the needle bar, a plurality of needles carried by said needle bar, and a plurality of looper means for cooperating with said needles to seize loops of yarn presented thereby, the improvement comprising, adjusting means for changing the reciprocating stroke of said needles, said adjusting means comprising a slot extending through said cam for receiving said shaft, said slot being elongated along a radial line substantially interconnecting said geometric center and said rotational axes, said slot having spaced side walls substantially parallel to said radial line, and locking means for locking said cam to said shaft with the axis of said shaft at preselected positions along said radial line, said locking means comprising plate means including a hub protruding from a face thereof, means defining an aperture extending through said hub for receiving said shaft, said hub including substantially linear side walls spaced apart a distance substantially equal to the spacing between the side walls of said slot for receipt of said hub within said slot while permitting said cam to be positioned along said radial line, said cam and plate means including selectable cooperating indexing means corresponding to preselected eccentricities of said cam, means for fastening said cam to said plate means with said hub within said slot in a position corresponding to a preselected eccentricity, and means for fastening said plate means to said shaft.

4,515,097
DRAPERY PLEAT HEMMING METHOD

Herman Rovin, c/o Automatech Industries Inc., Rte. 3 Box 370A, Piedmont, S.C. 29673

Filed Aug. 30, 1982, Ser. No. 412,553
Int. Cl.³ D05B 97/00, 35/08, 3/02
U.S. Cl. 112—262.3 5 Claims



1. The method of making pleated drapes or the like, in which a fabric panel is advanced widthwise, gathered periodically into multiple fold pleats along the top edge and secured at the pleat folds, the improvement which comprises

(a) advancing the top edge of the fabric widthwise in a controlled manner,

(b) forming a set of pleat folds in said top edge and gripping the folds,

(c) while continuing to grip said folds, incrementally advancing the fabric top edge to bring the next pleat fold region into pleat-forming position,

(d) while continuing to grip the previously formed pleat folds. controllably displacing the fabric in the region between the gripped pleat folds and the pleat forming position, to establish a predetermined spacing between adjacent pleats,

(e) forming a next set of pleat folds while continuing to grip the previous set and while maintaining the fabric controllably displaced, and gripping said last formed set of folds,

(f) while continuing to grip the beforementioned sets of pleat folds, incrementally advancing said fabric to bring said previously formed set of pleat folds into sewing position, and

(g) sewing said previously formed set of pleat folds.

4,515,098
DEVICE FOR DRIVING A SEWING MACHINE

Karl-Heinz Walther, Weilerbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,512
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 8124815[U]
Int. Cl.³ D05B 69/22, 69/16, 69/08, 55/14
U.S. Cl. 112—274 9 Claims

1. A device for driving a sewing machine from at least one predetermined stop position to at least one second predetermined position, the sewing machine having a main shaft, a positioning motor and transmission means connected between the main shaft and the motor for rotating the main shaft in a forward drive direction, the motor being operable for stopping the main shaft at the first position, comprising:

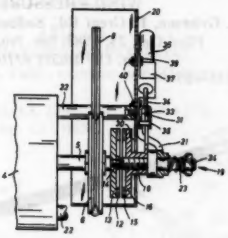
a driver disc connected to the transmission means;

a coupling disc movably mounted with respect to the sewing machine and engageable with said driver disc;

a supporting part movably mounted with respect to the sewing machine for movably carrying said coupling disc;

a cam surface defined on said coupling disc and fixed relative thereto;

a cam engaging surface defined on said supporting part and engaged with said cam surface for movement of said



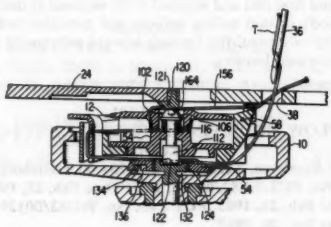
coupling disc into engagement with said driver disc upon relative movement between said support part and said coupling disc; and

drive means connected to said coupling disc for moving said coupling disc to engage said driver disc with and for further moving said coupling disc to rotate driver disc and thus rotate the main shaft in a direction opposite to the forward drive direction for bringing the main shaft into the at least one second predetermined position.

4,515,099
THREAD SEVERING ARRANGEMENT FOR THREAD WINDING BOBBIN

Gerald J. Creed, Rahway, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 25, 1984, Ser. No. 573,733
Int. Cl.³ D05B 59/00, 57/08
U.S. Cl. 112—279 6 Claims



1. In the bed of a sewing machine; a rotatable looptaker; a bobbin case within the looptaker; a bobbin supported for rotation in the bobbin case; a bobbin driver; a plunger which is axially movable but rotationally confined in the bobbin, the plunger being spring biased upwardly and having an actuating button thereon which projects above the bobbin; a plate slidable in the bed; a cam on the plate movable by the plate between a position in which bobbin winding operations are performed on the machine and a position in which sewing operations are performed, the actuating button on the plunger including a top planar surface, and the cam including a bottom planar surface to engage said planar surface on the button in the bobbin winding position of the slide plate and thereby hold the plunger downwardly in the bobbin in a position wherein the plunger is connected to the driver and the bobbin is rotatable by the driver acting through the plunger, one of the said

planar surfaces having a sharp edged hole therein and the other planar surface including a sharp edged elongate slot which is disposed to extend across the edge of said hole in the bobbin winding position of the slide plate.

4,515,100

ATTACHMENT FOR SAIL VEHICLES TO AUTOMATICALLY COMPENSATE FOR VARYING WIND PRESSURE

Robert A. Grierson, 11 Great Rd., Sudbury, Mass. 01776

Filed Oct. 24, 1983, Ser. No. 544,499
Int. Cl.³ B63H *9/10*
U.S. Cl. 114—97 **11 Claims**

1. A device for use in automatically adjusting the angular position of a boom supporting the foot of a sail in a sailing vehicle relative to a mast in said sailing vehicle supporting the luff of said sail in said sailing vehicle in order to compensate for sudden gusts of wind and the like, said device comprising:

a. an elongated tubular housing having a first end and a second end,

b. a pulley slidably mounted in said housing,

c. an adjustment block slidably mounted in said housing between said first end and said pulley,

d. an end block fixedly mounted on said housing at said first end,

e. a compression spring disposed inside said housing between said pulley and said adjustment block for urging said pulley away from said adjustment block,

f. means for mounting said housing on said boom, and

g. a line extending into said housing through said first end around said pulley and back out of said housing through said first end and adapted to be secured at one end to said body of said sailing vehicle and provided with means at the other end for limiting inward movement of said line into said housing.

4,515,101

FLOW-MODIFYING ELEMENT, ESPECIALLY A RUDDER

Bengt Akerblom, Tokers väg 1, S-231 00 Trelleborg, Sweden

PCT No. PCT/SE82/00230, § 371 Date Feb. 25, 1983, § 102(e) Date Feb. 25, 1983, PCT Pub. No. WO83/00129, PCT Pub. Date Jan. 20, 1983
PCT Filed Jun. 29, 1982, Ser. No. 474,647
Claims priority, application Sweden, Jun. 30, 1981, 8104074
Int. Cl.³ B63H *25/38*
U.S. Cl. 114—162 **5 Claims**

1. A hollow water-flow modifying element for boats and ships, said element having leading and trailing ends and a rear end proximate said trailing end, said element comprising

a pair of opposite side walls defining a space therebetween and having a pair of opposite, outer surfaces which are symmetrical in relation to each other and in relation to water flow when said boat or ship is moving forward on a straight course and with said element positioned such that said surfaces form substantially similar angles in relation to said course;

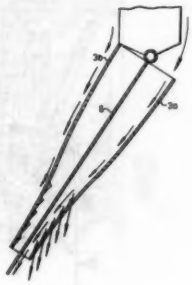
wherein one of said outer surfaces forms a suction side and the other a pressure side of said element when said element is positioned at an angle in relation to said course;

a central partition wall means for dividing said space into a pair of parallel, symmetrical flow passages extending in the direction of water-flow from the leading end to the trailing end of said element;

water inflow openings in said element at the leading end of said element in communication with each of said flow passages on either side of said partition;

water outflow openings arranged in each of said side walls in the rear end portion thereof;

wherein any water flow induced by movement of said element in water and passing through said flow passages is



symmetrically distributed through the outflow openings of said side walls when said element is moving forward on said straight course;

wherein such water flow will be distributed predominantly through the outflow openings at said suction side of said element to modify water flow therealong when said element is set at an angle in relation to said straight course; and

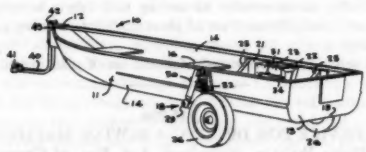
wherein said outflow openings are provided in vertical and horizontal rows in said side walls.

4,515,102

COMBINATION BOAT AND TRAILER ASSEMBLY WITH INTEGRATED RETRACTABLE TRAILER WHEEL STRUCTURE

John A. Kury, Beaumont, Tex., assignor to Port-A-Boat, Inc., Pensacola, Fla.

Filed Nov. 23, 1983, Ser. No. 555,635
Int. Cl.³ B63C *13/00*
U.S. Cl. 114—344 **15 Claims**



1. A combination boat and trailer assembly movable on land and on water having outboard wheel assemblies and support structure therefor provided in integrated relation on the boat, wherein the wheels can be lowered to form a trailering system when it is desired to tow the boat and can be raised to positions withdrawing the wheel assemblies above normal water level when the boat is waterborne, comprising a boat hull having bow and stern end portions and boat hull sides, hitch means at the bow of the boat for removable attachment to a trailer hitch ball of a towing vehicle, said wheel assemblies each having a pair of pivotally intercoupled articulated rigid arms and an interconnecting shock absorber located outwardly adjacent opposite sides of the boat hull providing an upper arm and a lower arm, a ground engaging wheel rotatably journaled on

the lower portion of said lower arm, said shock absorber resiliently maintaining said upper and lower arms substantially at an acute angle to each other within a predetermined angular range, a rigid axle member extending from and rigidly fixed to the upper arm intermediate its ends adapted to be disposed in horizontal position in use attitude of the boat, and a wheel assembly mounting frame structure fixed inwardly adjacent each side of the boat adjacent the wheel assemblies having means supporting a pair of axially spaced bearing members defining journal bearings aligned along a common axis extending transverse of the boat hull for the axle members associated with the respective wheel assemblies, and axle member rotating means located inboard of the boat affixed to inboard portions of each said axle member for rotating the axle members to angularly spaced first and second positions locating the wheel assemblies respectively in said lowered trailering position and in said raised position.

4,515,103

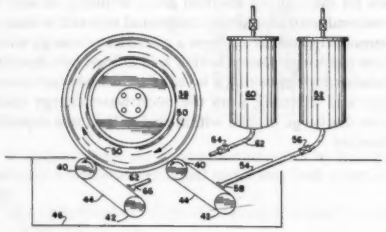
APPARATUS FOR COATING A TIRE TREAD

Robert E. Greig, 911 Imperial Palm Dr., Largo, Fla. 33541

Continuation-in-part of Ser. No. 343,406, Jan. 28, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 546,449

Int. Cl.³ B05C *1/02, 19/00*

U.S. Cl. 118—218 **3 Claims**



1. An apparatus for improving the friction-related and traction-related qualities of a tire having a tread formed by raised, road-contacting surfaces and depressed, non-road contacting surfaces, comprising,

a pit formed in a support surface,

a first pair of vertically spaced roller members comprising an upper roller member and a lower roller member,

a first belt member disposed in interconnecting relation between said first pair of upper and lower roller members,

a second pair of vertically spaced roller members comprising an upper roller member and a lower roller member,

a second belt member disposed in interconnecting relation between said second pair of upper and lower roller members,

said first and second pairs of roller members longitudinally spaced from one another by a distance sufficient to accommodate therebetween a vehicle tire,

said first and second pairs of roller members disposed within said pit so that the respective upper roller members of said first and second pair of roller members are positioned substantially coplanar with said support surface,

said vehicle tire contacting said first and second belt members at circumferentially spaced contact-regions thereon,

a first reservoir member for the storage of an adhesive,

said first reservoir member adapted to discharge said adhesive at preselected rates of discharge onto said first belt member at a point intermediate said first pair of upper and lower roller members,

a second reservoir member for the storage of particulate,

said second reservoir member adapted to discharge said particulate at preselected rates onto said second belt member at a point intermediate said second pair of upper and lower roller members,

said first and second belt members positioned so that their axes of rotation are parallel to the axis of rotation of the tire,

and a common belt-rotation means to impart unidirectional and uniform rate rotation to said first and second belt members so that adhesive is applied to said tire by said first belt member and so that said particulate is applied to said tire by said second belt member subsequent to said adhesive application.

4,515,104

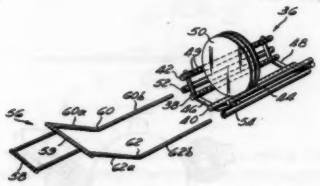
CONTIGUOUS WAFER BOAT

Steven N. Lee, Irvine, Calif., assignor to ASQ Boats, Inc., Tustin, Calif.

Filed May 13, 1983, Ser. No. 494,171

Int. Cl.³ B05C *13/02*

U.S. Cl. 118—500 **7 Claims**



1. A boat for supporting a batch of semi conductor wafers comprising support means having a plurality of slots for supporting a series of wafers in spaced, parallel relation with the slots extending from one end of the support means to the other with no obstruction extending beyond the ends so that a second boat of the same kind may be positioned in end-to-end relation with the first boat and the adjacent wafers between the mating ends of the boat will have the same spacing between them as the rest of the adjacent wafers, and a pair of pickup tubes secured to said support, with the tubes extending generally perpendicular to the wafer-receiving spaces defined by the slots, said tubes being sized to receive the tines of a fork-like tool for lifting the boat.

4,515,105

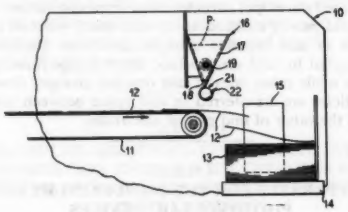
DIELECTRIC POWDER SPRAYER

William E. Danta, 10440 S. Mason St., Oak Lawn, Ill. 60453, and Frank H. Adams, 8014 S. Talman Ave., Chicago, Ill. 60652

Filed Dec. 14, 1982, Ser. No. 449,572

Int. Cl.³ B05B *5/02;* **B05C** *5/02;* **F23D** *11/32*

U.S. Cl. 118—629 **5 Claims**



1. In a dry powder sprayer forming a mist of dispersed powder particles for use in printing presses of the type discharging printed sheets successively onto a stack and having an elongated container for dry powder with an outlet spanning the path of the discharging sheets and positioned above the stack and means controlling the feeding of powder through said outlet, the improvement which comprises an elongated

electrode in the path of powder discharging from the outlet, said electrode having an electric current conducting core spanning the full length of the electrode and surrounded by a high dielectric plastics material cover, and means for feeding a high voltage current through the length of said core to provide an electrostatic field surrounding the electrode receiving controlled amounts of powder from said outlet.

4,515,106

DEVELOPING APPARATUS

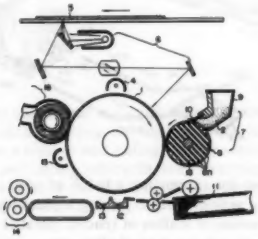
Mitsuaki Kohyama, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 13, 1983, Ser. No. 541,657

Claims priority, application Japan, Oct. 15, 1982, 57-180924; Oct. 15, 1982, 57-180925

Int. Cl.³ G03G *15/06*

U.S. Cl. 118—651 **18 Claims**



1. A developing apparatus operatively associated with an electrostatic latent image forming surface of an image carrier for supplying the electrostatic latent image forming surface with developer particles charged with a predetermined polarity to thereby develop an electrostatic latent image formed on the electrostatic latent image forming surface, said developing apparatus comprising:

a substrate having a portion in confronting relationship with said electrostatic latent image forming surface to establish a space between said portion and said electrostatic latent image forming surface, said charged developer particles being transferrable from said portion to said electrostatic latent image forming surface through said space;

at least one pair of adjacent spaced-apart electrodes formed on said substrate portion, each said electrode having a surface facing the electrostatic latent image forming surface; and

voltage impressing means for impressing said at least one pair of adjacent electrodes with a voltage of sufficient magnitude to generate an electric field which repels charged developer particles away from said surface of one of said pair of electrodes into said space, wherein certain ones of said repelled charged developer particles are attracted by said electrostatic latent image forming surface while other ones of said repelled charged developer particles are transferred in said space between said one and the other of said pair of electrodes.

4,515,107

APPARATUS FOR THE MANUFACTURE OF PHOTOVOLTAIC DEVICES

Eugene Fournier, Garden City, and Joachim Doehler, Union Lake, both of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Filed Nov. 12, 1982, Ser. No. 441,280

Int. Cl.³ C23C *13/10*

U.S. Cl. 118—718 **22 Claims**

1. An apparatus for manufacturing photovoltaic devices of the type including at least one layer of semiconductor material deposited onto a substrate; said apparatus comprising:

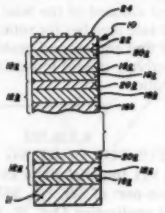
a source of substrate material;

at least one deposition chamber, said chamber arranged to deposit said layer of semiconductor material onto said substrate as said substrate is advanced therethrough;

a source of microwave energy;

means for continuously advancing said substrate material through said at least one deposition chamber;

coupling means coupling said microwave energy into said at least one deposition chamber, said coupling means comprising an antenna contained within said at least one deposition chamber; and



means for introducing reaction gases including at least one semiconductor containing compound into said at least one deposition chamber to form a microwave energy excited glow discharge plasma within said at least one deposition chamber for depositing a layer of semiconductor material onto said substrate from the microwave energy excited glow discharge plasma within said at least one deposition chamber.

4,515,108

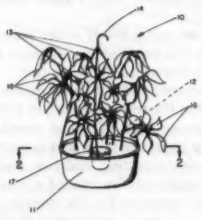
BIRD NESTING HABITAT

Henry Rankin, Jr., 505 Valley Rd., Fayetteville, N.C. 28305

Filed Mar. 22, 1984, Ser. No. 592,293

Int. Cl.³ A01K *31/14*

U.S. Cl. 119—45 R **11 Claims**



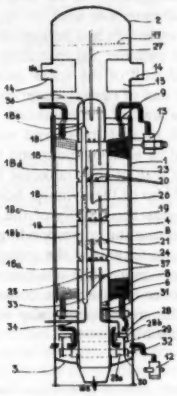
1. An artificial bird nesting habitat comprising: an open vessel means; a nesting chamber means having sides and being centrally disposed within said vessel means; foliage support material disposed within said vessel means and surrounding the sides of said nesting chamber means; and foliage like means mounted in and extending upwardly and outwardly from said support material whereby a relatively secure habitat is provided which will attract birds to nest within said chamber.

4,515,109

APPARATUS FOR THE PRODUCTION OF STEAM BY HEAT EXCHANGE BETWEEN A HEAT-TRANSFER LIQUID METAL AND FEED WATER, COMPRISING SEVERAL LIQUID METAL/INERT GAS INTERFACES

Georges Jullien, Saint Michel sur Orge, France, assignor to Novatome, Le Plessis-Robinson, France

Filed Feb. 28, 1983, Ser. No. 470,807
Claims priority, application France, Mar. 11, 1982, 82 04076
Int. Cl.³ F22B 1/02
U.S. Cl. 122—32 4 Claims



1. Apparatus for the production of steam by heat exchange between a heat-transfer liquid metal and feed water, comprising

(a) a cylindrical envelope (1), having a vertical axis closed by solid ends (2, 3);

(b) a hollow cylindrical central body (4) and a peripheral tube bundle (8) coaxially disposed within said envelope over only a portion of its height;

(c) at least one pipe (14) for introducing heat-transfer liquid metal into said envelope (1), said at least one pipe passing through the latter into a zone located above said tube bundle (8);

(d) at least one outlet pipe for the liquid metal, passing through the lower part of said envelope (1);

(e) means (12) for feeding the tubes of said bundle with feed water;

(f) means (13) for the recovery of steam produced in said tube bundle (8) by heat exchange between the liquid metal, circulating in contact with the surface of said tubes of said bundle, and said feed water, the top level (17) of the liquid metal having above it inert gas which fills the top part of said envelope; and

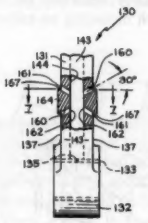
(g) a plurality of superposed compartments within said central body and separated from one another by transverse partitions (19) located at different heights inside said central body, apertures (20) being provided in a side wall of said central body in the lower part of each said compartment (18, 28) and each of said compartments (18c) being placed in communication with the compartment located directly thereabove (18*d*) by means of a substantially vertical first tube (23), and with the compartment (18*b*) located directly therebelow by means of a substantially vertical second tube (21), both tubes issuing into the compartment (18c) under consideration at a height such that the end of said second tube (21) is above the end of said first tube (23), the compartment located at the highest level (18*e*) communicating with the upper part of said envelope (1) filled with inert gas, while the compartment (28*a*) located at the lowest level is in communication with a reserve of neutral gas for establishing liquid metal inert gas interfaces in each of the successive compartments (18), through the introduction of inert gas from the compartment (28*a*) located at the lowest level.

4,515,110

ROD BEARING LUBRICATION FOR TWO-CYCLE ENGINES

John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008

Filed Jul. 23, 1984, Ser. No. 633,471
Int. Cl.³ F01P 1/04
U.S. Cl. 123—41.37 15 Claims



1. A method to lubricate and cool a piston rod and rod bearings, said rod being connected between a crankpin of a crankshaft and a wrist pin secured to a piston for a two-cycle internal combustion engine comprising the steps of:

forming a longitudinally extending bore within said rod, said bore communicates between said crankpin at a first end of said rod and said wrist pin at a second end of said rod,

forming an interconnecting passage means in said rod that communicates between said longitudinally extending bore and a crankcase chamber formed by and within an engine block of said two-cycle engine, said passage having a first inlet end and a second exit end, said rod forming a protrusion at said second exit end of said passage within said longitudinal bore,

injecting a combustible mixture of fuel and oil within said crankcase chamber from a source of said fuel and oil communicating with said chamber, and

collecting said mixture of fuel and oil entrained within said chamber through said interconnecting passage in said rod communicating between said longitudinally extending bore in said rod and said chamber, said fuel and oil enters said bore in said rod and exits through a crankpin rod bearing and a wrist pin rod bearing as said rod reciprocates with said piston and rotates around said crankshaft through said crankpin, said protrusion formed by said rod within said bore at said second exit end of said interconnecting passage means serves to divert said collection of fuel and oil around said passage means to inhibit said fuel and oil from exiting said passage means, said fuel and oil thereby lubricating said bearings and cooling said rod as said engine operates.

4,515,111

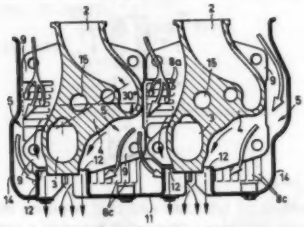
AIR-COOLED, RECIPROCATING PISTON, INTERNAL COMBUSTION ENGINE WITH CYLINDER HEADS FORMING ARCUATE OR S-SHAPED COOLING DUCTS THEREBETWEEN

Wilhelm Vosmeyer, Beaconsfield, Canada; Roderick Cole, Kirkland, Canada and Pavel J. Slezak, Quebec, Canada, assignors to KHD Canada Inc., Quebec, Canada

Filed Apr. 19, 1984, Ser. No. 601,961
Int. Cl.³ F01P 1/02
U.S. Cl. 123—41.61 13 Claims

1. In a air-cooled, reciprocating piston, internal combustion engine which defines a longitudinal axis and which includes at least one row of cylinders comprising individual cylinder

heads arranged side-by-side, said cylinder heads being provided with cooling ribs extending substantially normal to the axes of the cylinders, said cylinder heads including means for accommodating attachment bolts, said cylinder heads each having at least one inlet valve and one exhaust valve, the valve stems of which extend substantially parallel to the axes of the cylinders and are situated such that the plane passing through said valve stems lies at an acute angle to said longitudinal axis of the internal combustion engine, said cylinder heads each including an intake duct located on a side thereof which is swept by cooling air, said intake duct having its inlet opening aligned approximately centrally of the cylinder head, said cylinder heads each including an exhaust duct extending sub-



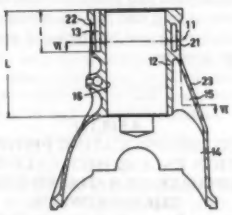
stantially perpendicularly to the exhaust air side, and a lateral deflector being provided adjacent the end cylinder head in each row, the improvement wherein each of the cylinder heads includes a central area between the valve stems therein, and wherein each cylinder head is externally shaped to provide at least one arcuate or S-shaped cooling air duct between it and an adjacent, similarly constructed cylinder head, and wherein each cylinder head includes an enclosed cover plate section facing the associated cylinder of the cylinder head, said enclosed cover plate being provided with cooling ribs at the cylinder head periphery, substantially on the exhaust air side thereof, and the side thereof facing the inlet valve stem, and includes boss means for accommodating attachment bolts.

4,515,112

ALUMINUM ALLOY CYLINDER BLOCK

Yasuhiro Tsuchiya, and Hitoshi Ozawa, both of Shizuoka, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 28, 1982, Ser. No. 426,077
Claims priority, application Japan, Oct. 28, 1981, 56-172466
Int. Cl.³ F02F *7/00, 1/06*
U.S. Cl. 123—41.84 **15 Claims**



1. An aluminum alloy cylinder block for use in a water-cooled internal combustion engine, said cylinder block having a longitudinal axis and comprising:

a plurality of cylinders formed integrally with the block and disposed in a row, each cylinder having an integral bore into which a piston is to be movably fitted, each bore having a center axis which intersects the longitudinal axis of the cylinder block, and each cylinder having an upper end where combustion occurs and a lower end;

a water jacket provided around the upper end of each cylinder, said water jacket being adapted to allow passage of water therein for cooling the upper end of the cylinder and having an outer side wall and a lower end wall integral with the cylinder, the lower end wall being spaced from the upper end of the cylinder by 0.2 to 0.5 times the length of the cylinder from the upper end to the lower end;

a crankcase having an outer side wall connected to and formed integrally with the lower end wall of the water jacket, said outer side wall having an inside surface spaced from the cylinders and an outside surface;

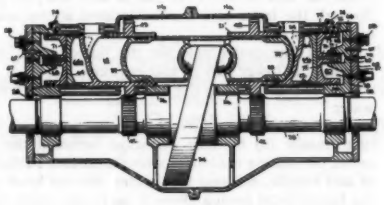
at least one cylinder rib extending downwardly from the lower end wall of the water jacket and outwardly from the lower end of each cylinder to the inside surface of the outer side wall of the crankcase being integrally formed with each of said lower end wall of the water jacket, lower end of each cylinder and the inside surface of the outer side wall of the crankcase for dissipating heat from the lower end of the cylinder below the water jacket and for increasing the rigidity of the engine, said at least one rib intersecting the corresponding cylinder at a line parallel to the center axis of the cylinder and located at a distance of not more than one quarter of a diameter of the cylinder bore from a plane containing the center axis of the cylinder and perpendicular to the longitudinal axis of the cylinder block.

4,515,113

SWASH PLATE ENGINE

John Z. DeLorean, 834 Fifth Ave., New York, N.Y. 10021

Filed Jun. 1, 1982, Ser. No. 383,989
Int. Cl.³ F02B *75/04*
U.S. Cl. 123—48 C **26 Claims**



1. An engine comprising

an engine block having at least one cylinder chamber, an intake duct extending to said cylinder chamber to deliver a combustible medium thereto and an exhaust duct extending from said cylinder chamber to exhaust a combustion gas therefrom;

a sleeve rotatably and axially mounted in said chamber, said sleeve having a cavity and a port communicating said cavity with a selected one of said ducts;

a piston slidably mounted in said cavity of said sleeve to define a compression chamber therewith;

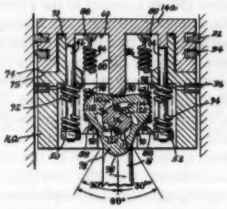
transmission means for reciprocating said piston within said sleeve while rotating said sleeve about an axis thereof to alternately communicate said port with said ducts; and

means for moving said sleeve axially in said block relative to said piston for adjusting said compression chamber in volume when the piston is at TDC.

4,515,114
TWO PART PISTON ASSEMBLY

Nguyen Dang, 2524 Clinton Ave. S., Minneapolis, Minn. 55404

Filed Aug. 15, 1983, Ser. No. 523,091
Int. Cl.³ F02B 75/04
U.S. Cl. 123—48 B 5 Claims

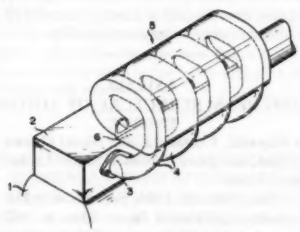


1. A two-part piston assembly for use in the cylinder bore of a four-stroke internal combustion engine having a connecting rod and a wrist pin comprising a piston having upper and lower parts, one atop the other, means for slideably connecting said parts whereby they move relative to each other between distended and compressed positions along an axis defined by the central axis of the cylinder bore, a contact member extending from said upper part toward said lower part, camming means responsive to the periodic angular movement of the connecting arm to rotate said camming means to engage said contact member and distend the parts when the piston is in the exhaust stroke and compress the parts when the piston is in the compression stroke, said camming means including a ring member operatively connected to said wrist pin, said ring member including at least one pawl in swiveling engagement therewith, and a cam having a plurality of lobes on its outer periphery and a ratchet wheel on its inner periphery sized to receive said at least one pawl, said lobes being aligned to engage said contact member.

4,515,115
INERTIA SUPERCHARGER FOR INTERNAL COMBUSTION ENGINES

Junpei Okubo, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,030
Claims priority, application Japan, Oct. 3, 1980, 55-140451
Int. Cl.³ F02B 75/22
U.S. Cl. 123—52 M 2 Claims



1. An inertia supercharging apparatus for a comparatively low speed internal combustion engine having cylinders within a cylinder head with a plurality of air intake ports formed therein, said supercharging apparatus comprising:

a generally barrel shaped surge tank having a substantially cylindrical peripheral surface enclosing an interior volume and having an air intake thereto; and

a plurality of spaced apart pipes each having two ends, each pipe having one of said ends open within said surge tank and extending spirally along the inside of said peripheral surface of said surge tank for most of its circumference, said pipes having their other of said ends projecting out of said surge tank through said peripheral surface and connected to respective air intake ports of said cylinder head, said pipes having spaces between them within said surge tank which are unobstructedly open to and form part of said interior volume of said surge tank, wherein said air intake ports are fitted with an air intake manifold consisting of said surge tank and said plurality of pipes, and the diameter of said surge tank is selected so that said pipes will have a length to approximately satisfy the formula:

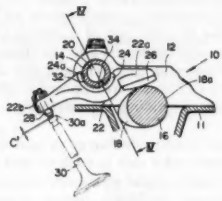
$$\gamma = \frac{a}{2\pi}\sqrt{\frac{F_{pip}}{V_h \times l}}$$

wherein γ is the frequency of air supplied into the intake manifold, a is the velocity of sound in the supplied air, F_{pip} is an inner sectional area of the surge tank of the air intake manifold, V_h is the effective cylinder volume, and 1 is the length of air travel through the air intake manifold including the air intake ports thereof.

4,515,116
VALVE OPERATING SYSTEM OF INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 31, 1983, Ser. No. 480,866
Claims priority, application Japan, Apr. 2, 1982, 57-55573
Int. Cl.³ F01L 1/24
U.S. Cl. 123—90.43 4 Claims



1. A valve operating system of an internal combustion engine, comprising:

a rocker arm disposed in abutting contact with and swingable relative to a rocker arm shaft, said rocker arm having a first end portion co-operative with an operating cam, and a second end portion co-operative with a valve stem,

a generally semicylindrical bearing section formed on said rocker arm at the central part thereof and at which said rocker arm is swingably supported on said rocker arm shaft, said bearing section abuttingly contacting and extending along the outer peripheral surface of said rocker arm shaft; and

means for supplying engine lubricating oil under pressure between said bearing section and said rocker arm shaft and forcing said rocker arm away from said rocker arm shaft during engine operation to effectively maintain zero valve clearance, said oil supplying means including means defining a closed end groove on a surface of said rocker arm bearing section which surface is contactable with the outer peripheral surface of said rocker arm shaft, said groove being formed with an arcuate shape and extending along the outer peripheral surface of said rocker arm shaft, means defining an oil passage in said rocker arm shaft, said oil passage being filled with engine lubricating oil supplied under pressure, and means defining a hole in said rocker

arm shaft to establish fluid communication between said oil passage and said groove.

4,515,117

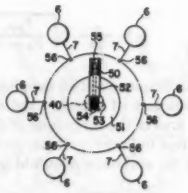
METHOD OF AND APPARATUS FOR IGNITING INTERNAL COMBUSTION ENGINE

Yukio Kajino, No. 3279-6, Oaza Yokoze, Yokoze-mura, Chichibu-gun, Saitama-ke, Japan

Continuation of Ser. No. 419,305, Sep. 17, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,866

Int. Cl.³ F02P *1/00, 5/04*

U.S. Cl. 123—146.5 A **1 Claim**



1. A method of igniting an internal combustion engine comprising the steps of:

generating a continuous train of pulses from a pulse generator adapted to generate pulses at such a desired pulse rate as to be capable of producing a desired number of electric discharges per one explosion step in each cylinder of the engine at a maximum number of rotations of a crank shaft of the engine,

stepping-up the voltage of the continuous train of pulses thus generated so that continuous electric discharges can be produced in a distributor and in ignition plugs of the engine cylinders,

distributing said stepped-up pulses from a feed arm carried by a rotor rotating in synchronism with said crankshaft of the engine to each one of a plurality of circumferential stationary electrodes of said distributor only and exclusively when said feed arm and one of said plurality of stationary electrodes are opposed to each other when said crank shaft is rotating at a relatively low number of rotations,

carrying out electric discharge of said stepped-up pulses at said desired pulse rate in each of said ignition plugs connected to each of said stationary electrodes respectively at the optimum explosion timing when evaporated fuel charges in each of the cylinders are compressed to the highest pressure when said crank shaft is rotating at a relatively low number of rotations, and

varying the angle of electric discharge of said stepped-up pulses from the feed arm to each of said opposing stationary electrodes by displacing said feed arm axially in the radial direction of rotation of the rotor in accordance with a centrifugal force generated by rotation of said rotor acting upon said feed arm when said crank shaft is rotating at a relatively high number of rotations, to provide advance control of ignition.

4,515,118

MAGNETO IGNITION SYSTEM, PARTICULARLY FOR ONE-CYLINDER INTERNAL COMBUSTION ENGINES

Georg Haubner, Ludwigstrasse 1, D-8431 Berg, and Hans-Dieter Schmid, Kamenzerstrasse 8, D-8500 Nürnberg, both of Fed. Rep. of Germany

Filed Jun. 19, 1984, Ser. No. 622,133

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325275

Int. Cl.³ F02P *1/08*

U.S. Cl. 123—149 C **9 Claims**

1. Magneto ignition system to provide ignition pulses to a spark plug (16) of an internal combustion engine (ICE) and electrical operating energy for a control circuit (22) to control the ignition instant, having

a magneto (10) including a rotating magnet (11, 12), a magneto coil (13) having a primary winding (14) and a secondary winding (15),

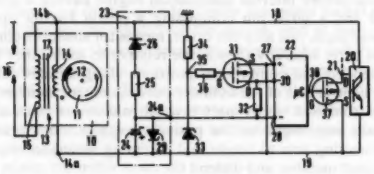
the secondary winding being coupled to the spark plug;

an ignition instant control circuit (22) including a control input terminal (30) to connect to the primary winding (14), and a semiconductor switch (20) having a main current carrying path, serially connected to the primary winding;

an energy supply circuit (23) having an output coupled to supply operating energy to the ignition instant control circuit including a storage capacitor (24) and a diode coupling network (26) coupling one output terminal (14*b*) of the primary winding to the storage capacitor for storing electrical energy upon rotation of the magnet,

wherein, in accordance with the invention,

the diode coupling network (26) includes at least one diode (26) which is polarized reversely with respect to the main current carrying path of the semiconductor switch (20);



one input of the energy supply circuit (23) being connected to a terminal (e.g. FIG. 1: 14*a*) of the primary winding;

an insulated gate semiconductor switch (31) and a load resistor (32) are provided,

the switching path of the insulated gate semiconductor switch being connected in parallel to the output (e.g. FIG. 1: 14*a*, 24*a*) of the energy supply circuit,

the output (D) of the insulated gate semiconductor switch (31) being connected to a control input (30) of the ignition instant control circuit (22), and the gate (G) of the insulated gate semiconductor switch (31) being connected to one of the terminals (e.g. FIG. 1: 14*b*) of the primary winding (14);

and another one (e.g. FIG. 1: 14*a*) of the terminals of the primary winding being connected to an energy supply terminal (e.g. FIG. 1: 27) of the ignition instant control circuit (22),

so that the another one terminal (14*a*) of the primary winding (14) is connected both to said energy supply terminal (27) of the ignition instant control circuit (22) and to said input of the energy supply circuit (23).

4,515,119

BEARING BEAM STRUCTURE OF AUTOMOTIVE ENGINE

Yoshimasa Hayashi, Kamakura, and Naoki Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 28, 1983, Ser. No. 470,372

Claims priority, application Japan, Mar. 4, 1982, 57-34245

Int. Cl.³ F02F *7/00;* **F02B** *77/00*

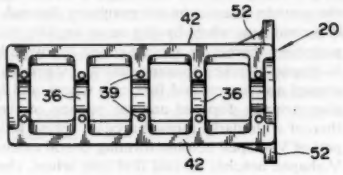
U.S. Cl. 123—198 E **6 Claims**

1. A bearing beam structure of an automotive internal combustion engine having a cylinder block formed with a plurality of bearing sections, said bearing beam structure comprising:

a plurality of main bearing cap sections each of which associates with one of said cylinder block bearing sections to rotatably support the journal of a crankshaft;

first and second side wall sections respectively connected with the opposite side portions of each bearing cap section to securely connect said bearing cap sections with each

other, each of said first and second side wall sections extending from a top portion to a bottom portion of each of said bearing cap sections, and being in contact with said cylinder block; and



first and second transmission installation sections to which a transmission housing is securely connected, said first and second transmission installation sections being formed respectively at said first and second side wall sections and located spaced from the cylinder block.

4,515,120

GOVERNOR FOR INTERNAL COMBUSTION ENGINE

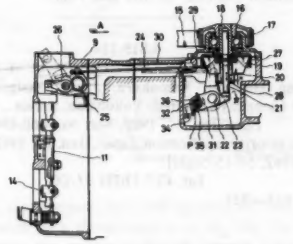
Koichi Amemori; Toshihiko Kawabe, both of Takatsuki, and Yosuke Takahashi, Kobe, all of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Aug. 24, 1983, Ser. No. 526,069

Claims priority, application Japan, May 16, 1983, 58-84069; Jun. 21, 1983, 58-110188; Jul. 27, 1983, 58-117689[U]

Int. Cl.³ F02D *1/04*

U.S. Cl. 123—368 **7 Claims**



1. A governor for an internal combustion engine for an outboard motor, of an arrangement in which the motion of a governor spindle is transmitted through a floating lever and a link member to a control rod for controlling the fuel injection of the engine, wherein said governor has a regulator handle operatively associated with a shaft of a grip of a steering handle of said outboard motor.

4,515,121

VALVE DRIVING CONTROL APPARATUS IN AN INTERNAL COMBUSITON ENGINE

Masaaki Matsuura, Tokyo, and Yoshikatsu Nakano, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,638

Claims priority, application Japan, Dec. 3, 1981, 56-194816

Int. Cl.³ F01L *1/34*; F02D *13/06*

U.S. Cl. 123—198 F **5 Claims**

1. A valve driving control apparatus for an internal combustion engine having a crankshaft and a power cylinder provided with a plurality of intake and exhaust valves, comprising:

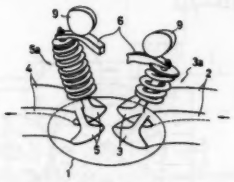
(a) an engine speed sensor means for generating an engine speed signal indicative of the rotational speed of the crankshaft;

(b) a cam shaft driven by the crankshaft;

(c) a plurality of cam assembly means associated with said cam-shaft for opening one of the intake and exhaust valves in accordance with the rotation of said cam-shaft at a predetermined valve timing;

(d) a first change-over means associated with said cam assembly means for selectively disabling operation of opening the intake valve upon receiving a first valve drive control signal;

(e) a second change-over means associated with said cam assembly means for selectively disabling an operation of



opening the exhaust valve upon receiving a second valve drive control signal; and

(f) a control means for producing said first and second valve drive control signal in response to said engine speed signal, said control means being arranged to produce said first and second valve drive control signals when the engine speed is lower than a first reference level, and to produce only said first valve drive control signal when the engine speed is between said first reference level and a second reference level higher than said first reference level.

4,515,122

MOUNTING FOR A VIBRATING SYSTEM

Jan Skorecki, Bramhall, England, assignor to National Research Development Corporation, London, England

Filed Apr. 20, 1983, Ser. No. 486,943

Claims priority, application United Kingdom, Apr. 26, 1982, 8211972

Int. Cl.³ F02B *77/00*

U.S. Cl. 123—198 E **2 Claims**

1. A mounting for interposition between an overhead camshaft internal combustion engine and a support base for the engine, the amounting comprising a deformable structure having a first portion which bears against and supports the engine and a second portion which bears against and is supported by the support base such that a load transmitting path is defined between the two said portions, and means for deforming the mounting structure in synchronism with the vibration of the engine such that the force exerted by the second portion on the support base remains substantially constant, wherein the deforming means is operative to apply an external deforming force to the mounting structure at a portion of the structure spaced from the main load transmitting path and comprises a lever system connected to the deformable structure and acted upon by a force which varies in synchronism with the vibration of the engine, wherein the deformable structure comprises a resilient cantilever one end of which is connected to the

engine and the other end of which is supported by a resilient member located on the base, the lever system comprising a substantially rigid lever attached to the said other end of the cantilever and wherein the lever is connected by a tie rod to a beam positioned adjacent the camshaft and acted upon by a cam follower in contact with a cam rotating with the camshaft.

4,515,123

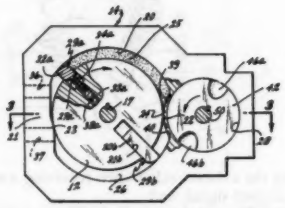
ROTARY INTERNAL COMBUSTION ENGINE

John L. Taylor, 12724 Barlin Ave., Downey, Calif. 90242

Filed Jul. 11, 1983, Ser. No. 512,325

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—222 **12 Claims**



1. A rotary internal combustion engine comprising:

a stator housing defining a power rotor cavity therein;

a power rotor rotatably mounted in said power rotor cavity and combining therewith to form an arcuate compression chamber and an arcuate expansion chamber;

a pair of diametrically disposed sliding vanes mounted on said power rotor, the outer end of each vane maintaining contact with the internal surface of said power rotor cavity during rotation of said power rotor;

an intake passage for transferring a quantity of fuel-air mixture into said arcuate compression chamber;

an exhaust passage for transferring exhaust gases resulting from combustion out of said arcuate expansion chamber;

each vane operable during each rotation of said power rotor to pass through the arcuate compression chamber to compress a quantity of fuel-air mixture and to pass through the arcuate expansion chamber upon the burning of said quantity of fuel-air mixture;

a rotary transfer valve housing forming a part of said stator housing and defining a cylindrical cavity therein located adjacent said power rotor cavity so as to have a common internal wall portion therewith;

a rotary transfer valve in the form of a plug having a pair of diametrically disposed pockets formed on the periphery thereof and rotatably mounted to have sealing contact with the wall of the cylindrical cavity in said rotary transfer valve housing;

a first port in the common internal wall portion of said power rotor cavity and said rotary transfer valve cavity for transferring a quantity of compressed fuel-air mixture in said arcuate compression chamber into a pocket of said rotary transfer valve;

a second port in the common internal wall portion of said power rotor cavity and said rotary transfer valve cavity for transferring said quantity of compressed fuel-air mixture out of the pocket of said rotary transfer valve into said arcuate expansion chamber behind the vane used to compress said quantity of fuel-air mixture;

ignition means for igniting said quantity of fuel-air mixture in said arcuate expansion chamber;

a cam wheel assembly mounted to rotate with said power rotor;

said cam wheel assembly including a first cam wheel and a second cam wheel larger in diameter than said first cam wheel;

said first cam wheel having formed on an angular portion of the periphery thereof an arcuate recess followed by a pair of V-shaped notches and having on a diametrically disposed angular portion of the periphery thereof a similarly formed arcuate recess followed by a pair of V-shaped notches, the remaining outer periphery of said first cam wheel being circularly formed;

said first cam wheel having on the face thereof a pair of diametrically disposed initiating pins located just ahead of the arcuate recesses on the periphery thereof;

said second cam wheel having on an angular portion of the periphery thereof an arcuate recess followed by a pair of V-shaped notches forming lateral extensions of the V-shaped notches on said first cam wheel, and having on a diametrically disposed angular portion of the periphery thereof a similarly formed arcuate recess followed by a pair of V-shaped notches forming lateral extensions of the V-shaped notches on said first cam wheel, the remaining outer periphery of said second cam wheel being circularly formed;

a timing wheel mounted to rotate with said rotary transfer valve;

first and second sets of spaced pins on diametrically disposed portions of the face of said timing wheel; and

a pair of diametrically disposed notches on the periphery of said timing wheel, said notches respectively substantially aligned with the leading edges of said pair of pockets on said rotary transfer valve;

said arcuate recesses and V-shaped notches on said cam wheel assembly coacting with the sets of pins on the face of said timing wheel and said pins on said first cam wheel respectively engaging said notches on said timing wheel to position each pocket on said rotary transfer valve opposite the first port to receive the quantity of compressed fuel-air mixture being compressed by a vane in said arcuate compression chamber and opposite the second port to deliver the quantity of fuel-air mixture into said arcuate expansion chamber behind said vane.

4,515,124

ENGINE CONTROL SYSTEM

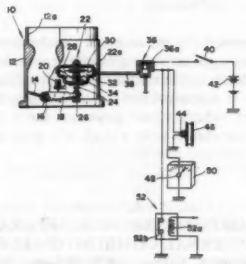
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 17, 1983, Ser. No. 460,494

Claims priority, application Japan, Ja.n. 21, 1982, 57-6600[U]; Feb. 5, 1982, 57-15756[U]

Int. Cl.² F02D *31/00*

U.S. Cl. 123—324 **10 Claims**



1. A control system for an internal combustion engine of a vehicle equipped with an accelerator pedal and an automatic transmission, comprising:

means for detecting one of an engine speed and a vehicle speed not lower than a predetermined level;

means for detecting an engine temperature not lower than a predetermined level;

means for decreasing the amount of air to be supplied to the engine by a predetermined amount during release of said accelerator pedal and only in response to (1) said one

detected speed and (2) said engine temperature being both not lower than said respective predetermined levels; and wherein said vehicle has a throttle valve controlled by the accelerator pedal and wherein the air amount decreasing mean includes throttle regulating means operative for placing the fully closed position of the throttle valve in a first state when at least one of said detected speeds is lower than said predetermined level and said engine temperature is lower than said predetermined level, and a second state when at least one of said detected speeds is not lower than said predetermined level and said engine temperature is not lower than said predetermined level, the valve opening degree of said second state being smaller than that of said first state.

4,515,125
SAFETY ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

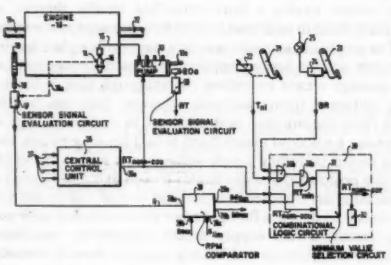
Rainer Buck, Tamm; Hermann Kull, Stuttgart; Fridolin Piwonka, Tamm; Albrecht Sieber, Ludwigsburg; Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,477

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301742

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—359 **10 Claims**



1. A safety arrangement for a self-igniting internal combustion engine such as a diesel engine or the like for a motor vehicle wherein the engine includes: throttle means; brake means; fuel pump means including a rack controller; and, an electronic control system including a central control unit for computing and generating a rack-travel nominal value signal $R_{nom\text{-}ccu}$ for supplying the same to the rack controller; the safety arrangement comprising:

first sensor means for providing an electrical signal N indicative of the rotational speed (rpm) of the engine;

second sensor means for providing an electrical signal T_{nl} of the no-load or idle position of said throttle means;

third sensor means for providing an electrical signal BR indicative of the position of said brake means; and,

a combinational logic circuit connected to said central control unit for receiving said rack-travel nominal value signal $R_{nom\text{-}ccu}$, said combinational logic circuit being further connected to each of said sensor means for receiving said signals N, T_{nl} and BR;

said combinational logic circuit including: combining circuit means for combining said signals N, T_{nl} and BR for forming a rack-travel value RT_{min}; and, minimum-value selection circuit means for receiving said RT_{min} and said $RT_{nom\text{-}ccu}$ for comparing the same and providing a new corrected rack-travel nominal value $RT_{nom\text{-}cor}$ for said rack controller.

4,515,126
DEVICE FOR DAMPING PERIODICALLY ALTERNATING LONGITUDINAL ACCELERATIONS OF A MOTOR VEHICLE

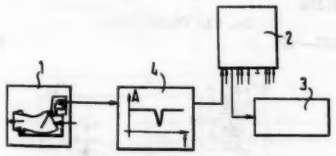
Jochen Kessler, Karlsruhe, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,555

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240293

Int. Cl.³ F02D *9/08*

U.S. Cl. 123—401 **8 Claims**



1. An installation for damping periodically alternating longitudinal accelerations, respectively, jerking movements of a motor vehicle which is driven by an internal combustion engine having control means for controlling the admixture of fuel, respectively, fuel-air mixture including electronic fuel injection means and a mechanically actuated throttle valve means in its air suction channel, wherein the jerking motions are damped by a damper means operatively connected into the control means, and

an electric filter means is interconnected as damper means into an electric connecting line from an air quantity measuring means to an electronic control apparatus, and

the filter means is operable to be short-circuited by a switch means actuated by the throttle valve mean by way of a relay means.

4,515,127
FOUR-CYCLE ENGINE

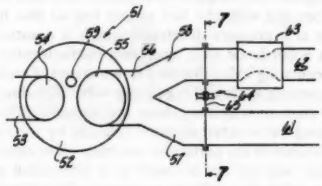
Tatsuzo Katsuoka, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Aug. 2, 1982, Ser. No. 403,926

Claims priority, application Japan, Aug. 7, 1981, 56-123891

Int. Cl.³ F02B *17/00*

U.S. Cl. 123—430 **8 Claims**



1. In an induction system for an internal combustion engine comprising a substantially open chamber of variable volume, first intake passage means for delivering a first charge to said chamber, and second intake passage means for delivering a second charge to said chamber, at least one of said intake passage means terminating at a poppet valve for controlling the flow into said open chamber, said charges having different mixture strengths, the improvement comprising means communicating said intake passage means with said chamber through a single intake port and single poppet type intake valve at different times during the intake cycle with the leaner charge being delivered to said chamber only during the initial portion of the intake cycle and the richer charge being deliv-

ered only at the ending portion of the intake cycle for stratifying the charge in said chamber.

4,515,128

FUEL INJECTION SYSTEM

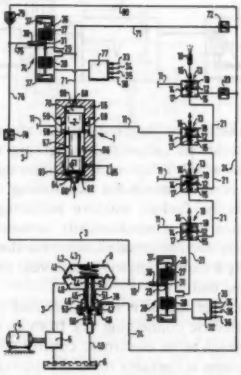
Günther Jäggle, Stuttgart; Wolfgang Maisch, Schwieberdingen; Klaus-Jürgen Peters, Affalterbach, and Rudolf Schütz, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,606

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248258

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—454 **1 Claim**



1. A fuel injection system for mixture-compressing internal combustion engines with externally supplied, ignition, comprising a metering sheath, a plurality of metering openings in said metering sheath which are variable in common by a movable control slide, said control slide including an annular control groove, a fuel metering valve disposed in a fuel supply line and intended for metering a quantity of fuel which is at a specific ratio to a quantity of air aspirated by the engine, said control slide opens metering openings more or less widely counter to a restoring force, said control slide includes one end which protrudes into a compression chamber, a restoring force pressure control line which communicates with said compression chamber and with the fuel supply line so that metering takes place at a pressure difference which is constant but is variable in accordance with operating characteristics of the engine, a regulating valve disposed downstream of each metering valve opening, each said regulating valve including a movable valve element which regulates the pressure difference at each metering valve acted upon on one side by the fuel pressure downstream of the particular metering valve opening and on the other side by the pressure in a differential pressure control line, a first electrofluidic converter of the nozzle/baffle type which is triggerable in accordance with operating characteristics of the engine and serves to apply a differential pressure in the differential pressure control line from the fuel supply line, to one side of said movable valve element, a throttle element downstream of said regulating valves and connected on one side to a fuel return line, the fuel pressure in the restoring force pressure control line is variable by means of a second electrofluidic converter of the nozzle/baffle type, which is triggerable in accordance with engine operating characteristics and is disposed upstream of a second throttle defining the restoring force pressure control line and connected at one end to said fuel return line, said second electrofluidic converter including an inlet which communicates with an intermediate line, which at one end communicates via an uncoupling throttle with the fuel supply line and the intermediate line is defined on the other end by a pressure regulating valve.

4,515,129

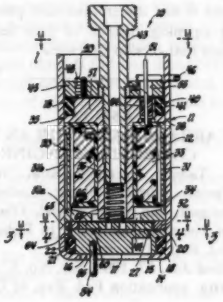
EDGE DISCHARGE PULSE FUEL INJECTOR

Ernest R. Stettner, Spencerport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 10, 1983, Ser. No. 503,070

Int. Cl.³ F02M *39/00;* **F16K** *31/04*

U.S. Cl. 123—472 **3 Claims**



1. An edge discharge pulse fuel injector for discharging fuel to the cylinder of an internal combustion engine including a housing means having a bore extending axially therein; an orifice plate fixed in said bore of said housing adjacent one end thereof to partly enclose said one end, said orifice plate having a valve seat surface and an opposed outboard surface with an orifice passage means extending therethrough that is located radially outward from said axis whereby fuel can be discharged from the injector next adjacent to one outer edge of said housing; a solenoid means fixed in said housing means, said solenoid means including a pole piece means with a flat working surface positioned at right angles to said axis and located in axial spaced apart opposed relationship to said valve seat surface whereby to define a fuel chamber therewith and with said housing means; a fuel supply means operatively associated with said housing means and having one end thereof connectable to a source of fuel and having its other end in flow communication with said fuel chamber; an armature valve means loosely positioned in said fuel chamber for movement between said opposed working surface of said pole piece means and said valve seat surface; and, a spring means operatively associated with said armature valve means to normally bias said armature valve means into seating engagement with said valve seat surface; one of said armature valve means and said valve seat surface presenting a surface inclined at an angle to said axis whereby the axial movement of said armature valve means between said valve seat surface and said working surface of said pole piece is greater adjacent to said orifice passage means than at a location diametrically opposite thereof.

4,515,130

METHOD FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AT DECELERATION

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,167

Claims priority, application Japan, May 17, 1982, 57-82837

Int. Cl.³ F02B *3/04;* **F02D** *5/02, 5/00, 35/00*

U.S. Cl. 123—493 **6 Claims**

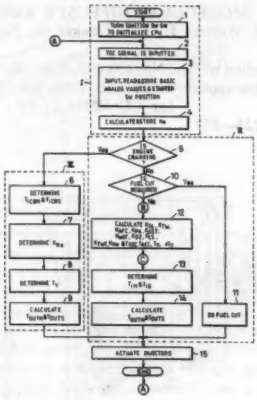
1. A method for controlling the quantity of fuel being supplied to an internal combustion engine having an intake passage and a throttle valve arranged therein, at deceleration thereof, by the use of electronic means operable in synchro-

nism with generation of a predetemined control pulse signal, the method comprising the steps of:

(1) detecting the valve opening of said throttle valve while said throttle valve is being closed at deceleration of the engine and each time each pulse of a predetermined sampling signal is generated;

(2) determining the difference between a value of the valve opening of said throttle valve detected at the time of generation of a present pulse of said sampling signal and one detected at the time of generation of the preceding pulse of said sampling signal, and providing a control parameter having a value corresponding to the difference thus determined; and

(3) after the lapse of a predetermined period of time from the time the value of said control parameter becomes smaller than a predetermined negative value, decreasing the quantity of fuel being supplied to the engine by an amount corresponding to the value of said control parameter.



4,515,131

FUEL-INJECTION CONTROL IN AN INTERNAL-COMBUSTION ENGINE

Yukio Suzuki; Kunihiko Sato, and Motoyasu Muramatsu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 1, 1982, Ser. No. 445,991

Claims priority, application Japan, Mar. 30, 1982, 57-50117

Int. Cl.³ F02M *51/00*

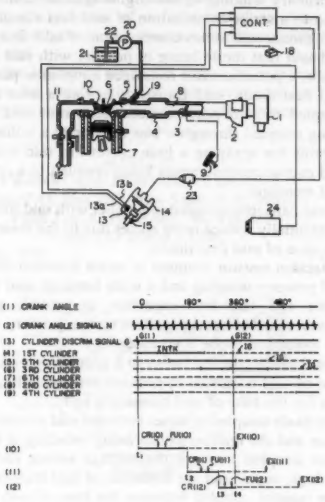
U.S. Cl. 123—491 **4 Claims**

1. Aa method for controlling fuel injection in an internal-combustion engine, comprising the steps of:

producing crankshaft angle signals and cylinder discrimination signals with a crankshaft angle sensor,

determining generation of a signal for execution of the first injection of fuel in response to the produced crankshaft angle signals and the produced cylinder discrimination signals, and

performing the first injection of fuel in accordance with the first crankshaft angle signal after the starting of cranking of the engine in response to said determination so that the first explosion of the air-fuel mixture takes place within one rotation of the crankshaft of the engine.



4,515,132

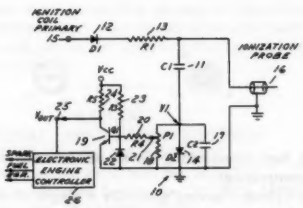
IONIZATION PROBE INTERFACE CIRCUIT WITH HIGH BIAS VOLTAGE SOURCE

Robert L. Anderson, Saline, and William R. McDonald, Westland, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1983, Ser. No. 564,280

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—494 **1 Claim**



1. A vehicle engine ionization probe interface circuit means for detecting cylinder combustion in an engine having an ignition coil with a relatively high voltage primary winding and for applying a bias voltage to an ionization probe, said ionization probe interface circuit means including:

a coupling means for coupling the primary winding of the engine ignition coil to said ionization probe;

said coupling means including a first capacitor connected in parallel with said ionization probe for charging in response to ignition coil primary current,

a transistor coupled to said ionization probe to provide a logic level output voltage signal as a function of a resistance change in the ionization probe due to occurrence of cylinder combustion, and an engine control means coupled to said transistor for controlling engine operating

parameters in response to the logic level output voltage signal;

said primary winding of the engine ignition coil being coupled to a series combination of said first capacitor and a first diode, said series combination of said first capacitor and said first diode being in parallel with said ionization probe, a potentiometer resistance coupled in parallel with said first diode, said transistor having a base adjustably coupled to said potentiometer resistance and said base being coupled through a bias resistor to a voltage source suitable for applying a base current to said resistor, and said engine control means being coupled to a collector of said transistor;

a second capacitor coupled in parallel with said first diode to substantially reduce noise spikes due to the reverse recovery time of said first diode;

a protection resistor coupled in series between the ignition coil primary winding and a node between said ionization probe and said first capacitor to provide protection against shorting out the ignition system primary winding if the ionization probe is shorted;

a second diode coupled between a ground potential and the base of said transistor to provide reverse voltage protection for the base of said transistor; and

a third diode coupled in series between said protection resistance and the ignition coil primary winding, a load resistance coupled between the voltage source for applying the logic signal and the collector of said transistor, and a base resistor coupled between the base of said transistor and said potentiometer.

4,515,133

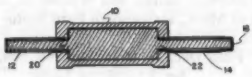
FUEL ECONOMIZING DEVICE

Frank Roman, Star Rte. 113, Long Pond, Pa. 18334

Filed May 31, 1984, Ser. No. 615,581

Int. Cl.³ F23D *21/00*

U.S. Cl. 123—538 **4 Claims**



1. A fuel economizing device for internal combustion engines comprising:

(a) a cylinder having generally a length of about 2.25 inch and a diameter of about 0.75 inch, said cylinder also having an inlet at one end and an outlet at the opposite end;

(b) a conduit, said conduit mated at its one end to said cylinder inlet, said conduit opposite end being adapted to connect to a fuel pump outlet line;

(c) a second conduit, said second conduit mated at its one end to said cylinder outlet, said conduit opposite end being adapted to connect to a carburetor fuel inlet line; and,

(d) a restricted opening, said restricted opening positioned at the terminus of said second conduit's opposite end, said restricted opening having a diameter ranging from about 0.045 inch to about 0.050 inch,

so that fuel passing through said inlet conduit under pressure from a fuel pump, enters said cylinder where said fuel is concentrated under pressure, and exits through said restricted opening causing said fuel to atomize into a combination of liquid and vapor state due to the pressure drop across said restricted opening.

4,515,134

MOLECULAR DIFFUSER ASSEMBLY

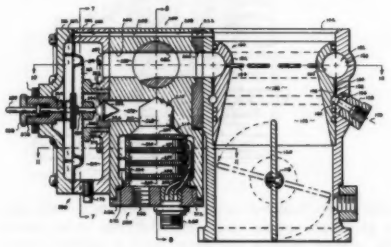
Conrad K. Warren, II, 1401 Quaker St., No. 3, Golden, Colo. 80401

Continuation of Ser. No. 134,107, Mar. 26, 1980, abandoned.

This application Jan. 15, 1982, Ser. No. 339,297

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **12 Claims**



1. Apparatus for delivering a fuel/air mixture to the induction system of a combustion chamber, said apparatus comprising:

structure presenting a passageway adapted for communication with said induction system and having an air-receiving inlet;

means for deriving information indicative of the mass flow rate of an airstream drawn through said passageway by said induction system upon demand therefor by said combustion chamber;

evaporator means for vaporizing liquid fuel supplied thereto;

conduit means extending from said evaporator means and including a first channel surrounding said passageway;

means for communicating said vaporized fuel disposed about said first channel to the interior of said passageway and at a region adjacent said inlet for introducing said vaporized fuel from a plurality of points about the exterior of said passageway and into said airstream for a dispersed diffusion of said vaporized fuel to provide said fuel/air mixture;

regulator means interposed in said conduit means and responsive to the mass flow rate information from said deriving means for controlling a flow of said vaporized fuel from said conduit means into the airstream in accordance with said demand;

a slot downwardly extending from said first channel;

a second channel extending about the exterior of said passageway structure and isolated therefrom, said second channel communicating with said slot at a position below said first channel; and

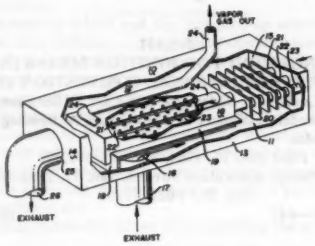
a discharge line extending from said second channel for returning said condensate to a supply of said liquid fuel whereby condensate of said vaporized fuel along the extent of said first channel is directed into second channel by said slot and away from said vaporized fuel entering said first channel to generally preclude delivery of said condensate into said interior of said passageway and said downstream induction system.

4,515,135

HOT FUEL GAS GENERATOR

James W. Glass, New Castle, Pa., assignor to General Energy Systems, Inc., Youngstown, Ohio

Filed Jan. 6, 1984, Ser. No. 568,812
Int. Cl.[3] F02M *31/00*
U.S. Cl. 123—557 7 Claims



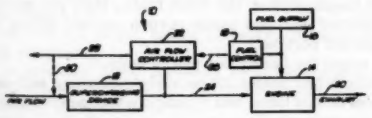
1. An improvement in a fuel supplying system for an internal combustion engine having inlet and exhaust manifolds with inlet and outlet ports, a fuel conducting device in communication with said inlet manifold, controlled air supplying means in communication with said device, a measuring valve in communication with said fuel conducting device; the improvement comprising a hot fuel gas generator upstream of said measuring valve in said fuel supplying system, said hot fuel gas generator comprising a first hollow body of a known size, a second smaller hollow body with said first hollow body positioned in spaced relation thereto, inlet and outlet ports in said first hollow body, means connecting said inlet port in said first hollow body with said exhaust manifold outlet port, at least two tubes positioned in said first hollow body and having portions of said tubes extending exteriorly of said first hollow body and other portions of said tubes extending into said second hollow body, said portions of said tubes in said second hollow body having openings therein, fins on said portions of said tubes in said first hollow body, baffles in said first hollow body positioned to guide hot exhaust gases from the inlet port in said first hollow body around said second hollow body and against said fins on said tubes in said first hollow body so that said tubes form heat exchangers vaporizing fluids therein, fuel supplying means in communication with at least one of said tubes, a delivery tube in said first hollow body communicating with said second hollow body and extending exteriorly of said first hollow body and communicating with said measuring valve in communication with said fuel conducting device.

4,515,136

SUPERCHARGED DIESEL ENGINE AIR INFLOW CONTROL SYSTEM

Robert L. Cholvin, Santa Monica; Charles E. McInerney, Rolling Hills Estates; James N. Nancarrow, Torrance, and Jack L. Gantz, Marina Del Rey, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 424,205, Sep. 27, 1982,. This application Dec. 19, 1983, Ser. No. 562,798
Int. Cl.[3] F02D *23/02*
U.S. Cl. 123—564 5 Claims



2. A method of controlling engine air inflow in a diesel engine system including means for supplying pressurized air to an engine and means for supplying fuel to the engine, comprising the steps of:

selecting the flow of fuel to the engine;

modulating the position of a force-biased air flow relief valve in response to the pressure of air supplied to the engine; and

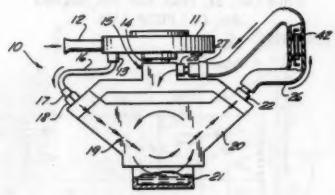
adjusting the inflow of air to the engine in response to the fuel flow by altering the force-bias acting on said relief valve in response to the fuel flow to the engine.

4,515,137

CRANKCASE EMISSIONS DEVICE

John Manolis, P.O. Box 380, New York, N.Y. 10028

Filed Feb. 8, 1984, Ser. No. 578,077
Int. Cl.[3] F02M *25/06*
U.S. Cl. 123—572 3 Claims



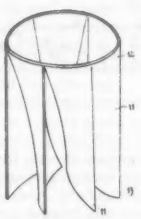
1. An improved device for separating liquid from gases and vapors passing from the crankcase of an internal combustion engine to the intake manifold thereof and allowing return of the separated liquid to the crankcase through a conduit interconnecting the crankcase with the intake manifold, the improvement comprising a restricting means providing a restricted flow path for the crankcase gases and vapors and a surface upstream of said restricted flow path for allowing separated liquid to collect thereon for return to the crankcase, said restricting means including a ring-like member adapted to be held in mating relationship with and within the conduit, said ring-like member having a port to allow fluid flow therethrough, a tube-like member extending from one side of said ring-like member and providing a flow passage with said port, and baffle means associated with said tube-like member generally to block direct flow into the flow passage of said tube-like member, yet allow access to the flow passage for flow through said tube-like member such that liquid associated with the crankcase gases and vapors will tend to collect at said device for return to the crankcase.

4,515,138

INTERNAL COMBUSTION ENGINES

Isaac Agadi, 16 Ir Hayona St., Tel-Aviv, Israel

Filed Jun. 19, 1979, Ser. No. 50,017
Claims priority, application Israel, Jun. 23, 1978, 54993
Int. Cl.[3] F02M *29/00*
U.S. Cl. 123—590 6 Claims



1. A device for improving the combustion characteristics of

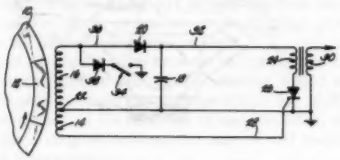
a flowing fuel-air mixture, the device defining an axis of flow for the mixture and comprising a plurality of vanes extending generally longitudinally of and disposed about said axis, each vane having first and second ends joined by first and second longitudinal edges, the first ends being contiguously arranged to extend along the circumference of a circle coaxial with said axis, said first edges defining a cylindrical surface coaxial with said axis and said second edges defining a conical surface coaxial with said axis, the vanes being interconnected at their first ends and said second ends are disposed generally radially of said axis and extend from said cylindrical surface to said axis, the vanes substantially meeting at said axis.

4,515,139

LOW MOISTURE SENSITIVE IGNITION

Joseph B. St. Ledger, Knoxville, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 21, 1983, Ser. No. 544,093
Int. Cl.³ F02P 3/06
U.S. Cl. 123—599 **1 Claim**



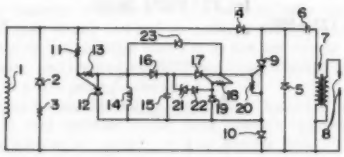
1. A capacitor discharge ignition system comprising, a charging coil, a first diode having an anode and a cathode, a direct connection between said anode and said coil, a capacitor connected to said cathode for charging by said coil, an ignition transformer having a primary and a secondary winding, said primary winding being connected to said capacitor, a trigger device connected to said primary winding to discharge said capacitor to ground through said primary winding, a second diode having an anode directly connected to said connection between said charging coil and said first diode and also having a cathode, and a shutdown switch connected in series between said cathode of said second diode and ground.

4,515,140

CONTACTLESS IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

Kiyoshige Enomoto, and Masao Iwata, both of Kanagawa, Japan, assignors to Oppama Kogyo Kabushiki Kaisha, Yokosuka, Japan

Filed Apr. 26, 1983, Ser. No. 488,753
Claims priority, application Japan, Nov. 4, 1982, 57-193744
Int. Cl.³ F02P 3/06, 1/00, 1/17
U.S. Cl. 123—603 **5 Claims**



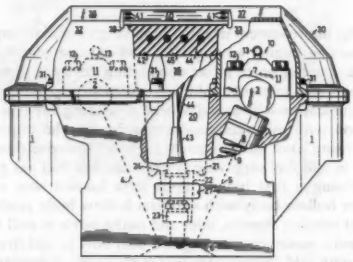
1. A contactless ignition device for internal combustion engines comprising an exciter coil and pulser coil inducing voltages of phases substantially reverse to each other in response to the rotation of the internal combustion engine, a first capacitor charged with the voltage induced by the exciter coil, an ignition coil feeding a high voltage to a spark plug by receiving the voltage discharge by said first capacitor, a second capacitor charged with the voltage induced by said pulser coil, a first switching element conducting the voltage discharged by said second capacitor, a second switching element enabling the discharge of said first capacitor with the conduction of said first switching element and a third switching element making said first switching element or second switching element conductive by being conductive at a set constant rotating speed of the internal combustion engine.

4,515,141

ARRANGEMENT FOR IGNITION MEANS IN A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Lars L. SäE,uml/a/ f, Södertälje, and Lars E. Bergsten, Järna, both of Sweden, assignors to Saab-Scania Aktiebolag, Södertälje, Sweden

Filed Jan. 16, 1984, Ser. No. 571,096
Claims priority, application Sweden, Jan. 17, 1983, 8300190
Int. Cl.³ F02B 77/00
U.S. Cl. 123—647 **10 Claims**



1. An arrangement for protecting ignition means in a multi-cylinder internal combustion engine, including a cylinder head and two longitudinal, parallel valve cover banks mounted thereon, a longitudinal space for the ignition means to the combustion chambers of the engine being arranged between the valve cover banks and defined by the opposing surfaces of the valve cover banks wherein the longitudinal space is a trough having a bottom, two side walls and front and rear end walls formed within the cylinder head, the trough being covered by a removable lid joining on to both valve cover banks and on to at least one end wall of the trough, and in that the trough is formed with at least one opening in the cylinder head for ventilation and drainage.

4,515,142

COMPOUND BOW AND ECCENTRIC WHEEL ASSEMBLIES THEREFOR

David J. Nurney, Seattle, Wash., assignor to Indian Industries, Inc., Evansville, Ind.

Filed Jan. 31, 1983, Ser. No. 462,385
Int. Cl.³ F41B 5/00
U.S. Cl. 124—23 R **11 Claims**

1. A compound bow having adjustable eccentric wheel assemblies, said compound bow comprising:

a center handle portion for gripping the bow;

a pair of limbs extending outwardly from opposite ends of said handle portion, said limbs having inner end portions connected with said handle portion and also having free outer end portions;

cable means for flexing said pair of limbs;

eccentric wheel means for movably supporting said cable means on said limbs, said eccentric wheel means including an eccentric wheel assembly attached to the free outer end portion of each of said pair of limbs; and

attachment means for rotatably attaching the eccentric wheel assemblies to said limbs;

each of the eccentric wheel assemblies including:

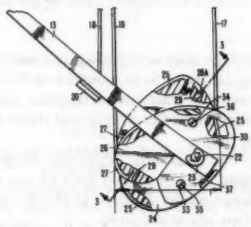
a bowstring wheel having a central portion and a periphery, the bowstring wheel defining a first, cable-receiving groove about at least a portion of its periphery;

a first take-up wheel component mounted to the bowstring wheel, the first take-up wheel component having a central portion and a periphery and defining a second, cable-receiving groove about at least a portion of its periphery;

the bowstring wheel and the first take-up wheel component also defining a passageway communicating with the first and second grooves and extending through the central portions of the bowstring wheel and the first take-up wheel component;

at least one second take-up wheel component removably mountable to one of the bowstring wheel and the first take-up wheel component, the second take-up wheel component including a periphery and defining a third cable-receiving groove about at least a portion of its periphery; and

mounting means for removably mounting the at least one



second take-up wheel component to the bowstring wheel and the first take-up wheel component to align the third cable-receiving groove with the second cable-receiving groove such that upon rotation of the first and second take-up wheel components a cable received within the second groove is also received within the third groove;

said cable means including a continuous cable having end portions secured to said pair of limbs and a central bowstring portion extending between the eccentric wheel assemblies, each of the end portions being associated with and extending over one of the pair of eccentric wheel assemblies, each of the end portions for the associated eccentric wheel assembly extending within the first, cable-receiving groove, through the passageway and within the second, cable-receiving groove, said compound bow having a first, relaxed condition in which the end portions are displaced from the third, cable-receiving groove of the associated eccentric wheel assembly, said compound bow also having a second, drawn condition in which the end portions are received within the third, cable-receiving groove of the associated eccentric wheel assembly.

4,515,143

MOVING AIR OVEN FOR BAKING AND THE LIKE

Florian H. Jabas, 712 Chautauqua Rd., Marinette, Wis. 54143

Filed Apr. 27, 1984, Ser. No. 604,455

Int. Cl.³ A21B *1/06*; F24C *15/32*

U.S. Cl. 126—21 A **7 Claims**

1. An oven for evenly baking or heating products placed therein, comprising:

(a) an insulated frame consisting of interconnected back, side, top and bottom walls, said frame defining at least one opening at the front thereof,

(b) door means to close said opening and thus form with said walls an oven enclosure,

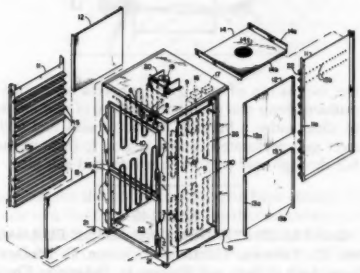
(c) an inner cover positioned adjacent and in spaced relation to said top wall to form therewith a top air channel, said inner cover being formed with an opening to permit recirulation of air from said enclosure,

(d) fan means positioned in said top air channel above said opening, and motor means for driving said fan means,

(e) plate means vertically positioned at each side of said enclosure and spaced from said side walls so as to define therewith outer air channels in air flow communication with said top air channel, said plate means being formed with openings in the bottoms thereof,

(f) heating means positioned in said outer channels and spaced from said plate means and said side walls so as to accommodate air flow on either side thereof,

(g) inner walls spaced inwardly from said plates and defining therewith inner flow channels communicating with said outer channels through said bottom openings in said plate means, said inner walls being formed with a series of



horizontally aligned and vertically spaced openings through which air can pass from said inner channel toward said enclosure, and

(h) air guide means mounted on the inner surface of said inner walls, said air guide means being aligned with and covering said series of openings formed in said inner walls and having open inner ends through which the heated air can pass into said enclosure,

whereby air is circulated by said fan outwardly through said top air channel, downwardly past said heating means in said outer channels so as to heat said air, upwardly through said inner channels and through said series of openings in said inner walls and then through said air guides to said enclosure, the arrangement providng even heating of said enclosure from top to bottom and laterally across.

4,515,144

HAND-FIRED, SOLID FUEL STOVE

Edward H. Cumpston, 6 Stonehedge Dr., Bennington, Vt. 05201

Filed Oct. 24, 1983, Ser. No. 544,570

Int. Cl.³ F24C *1/00*

U.S. Cl. 126—58 **15 Claims**

1. A hand-fired, solid fuel stove having a fuel opening closed by a fuel door, a grate below and adjacent said fuel opening, an ash pit under said grate, and a combustion air inlet to a region under said grate, said stove comprising:

a. said grate being inclined to slope downward with increasing distance from said fuel opening;

b. an upper surface of said inclined grate being generally flat so that a poker can skid freely along said upper surface;

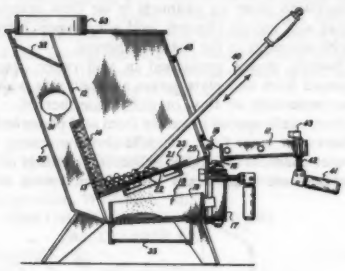
c. said grate being arranged to stay fixed in place during use;

d. a central region of said grate having a plurality of perforations through which combustion air can rise and ashes can fall;

e. an upper border of said grate in a region near said fuel opening being unperforated; and

f. said perforated central region of said grate being sufficiently close to said fuel opening and said fuel opening

having a lower edge spaced sufficiently close to said upper border of said grate so that a hand-held poker can be thrust through said fuel opening to engage said upper border of said grate at an acute angle a few degrees above



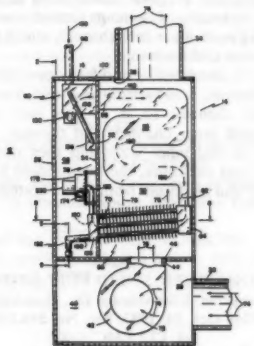
the inclination of said grate wherein said poker can be skidded along said flat upper surface of said inclined grate to slide under a burning region of said fuel bed located over said perforated central region to dislodge ashes that fall through said perforations into said ash pit.

4,515,145

GAS-FIRED CONDENSING MODE FURNACE

William R. Tallman, Huntington; Steven C. McDevitt, Fort Wayne, both of Ind., and Warren H. Delancey, Elyria, Ohio, assignors to Yukon Energy Corporation, Minneapolis, Minn.

Filed Oct. 3, 1983, Ser. No. 538,582
Int. Cl.³ F24H *3/08*
U.S. Cl. 126—99 A **20 Claims**



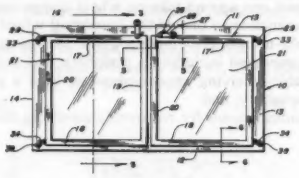
1. In a hot air furnace including means for burning fluid fuel, exhaust passage means for carrying the products of combustion from the burner means to an exhaust flue, heat exchanger means in the exhaust passage means for extracting heat from the products of combustion therein, air passage means for carrying a flow of air over the heat exchanger means to be heated thereby, and air moving means for causing a flow of air through the air passage means, the improvement comprising: means communicating with said exhaust passage means for enclosing said burner means, said burner means firing into said exhaust passage means; a fresh air duct communicating with said enclosing means for admitting combustion air thereto; condenser means in said exhaust passage means for removing water from the products of combustion therein, said condenser means being exposed to said air passage means; and second air moving means in said exhaust passage means for causing fluid flow therein from said fresh air inlet duct through said enclosing means and said exhaust passage means to said exhaust flue.

4,515,146

FIREPLACE DOOR

Donald W. Wilkening, Akeley, Minn. 56433

Filed Oct. 20, 1983, Ser. No. 543,626
Int. Cl.³ F24C *15/10*
U.S. Cl. 126—140 **7 Claims**



1. A fireplace door comprising, in combination;
a rectangular frame to be mounted on the front of a fireplace and having at least one rectangular opening;
a door dimensioned to overlie said frame over each opening in said frame;
laterally and angularly adjustable hinge means pivotally mounting the side of said door to one side of said frame, said hinge means disposed at the top and bottom side of said door and said frame;
adjustable mounting means on the inside periphery of said door;
a transparent panel disposed intermediate said mounting means and the inside of said door;
gasket means disposed intermediate said adjustable mounting means, said panel and said door, said gasket means including a looped portion extending toward said frame and being comprised of resilient, fire resistant material; and
latch means rotatably disposed on top of each door, said latch means operable to engage a catch extending forwardly of the top of said frame and including an operating handle operable to bias said catch means into engagement with said catch.

4,515,147

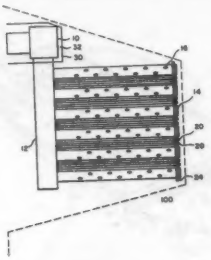
CLEAN BURNING GRATE FOR FIREPLACES AND WOOD STOVES

Samuel J. Van Grouw, 1142 Blythe St., Foster City, Calif. 94404, and Richard D. Smith, 2415 S. Court, Palo Alto, Calif. 94301

Filed Jan. 23, 1984, Ser. No. 572,986
Int. Cl.³ F23H *1/02*
U.S. Cl. 126—163 R **15 Claims**

1. An improved grate for the efficient burning of solid fuel, said grate comprising
a plurality of substantially parallel, hollow first support members defining a first generally planar surface for supporting the lower surface of solid fuel,
a plurality of substantially parallel second support members defining a second generally planar support surface located below said first surface, said second support members being located between alternate ones of said first support members and defining, in combination with said first support members, a plurality of troughs for supporting glowing coals,
a multiplicity of orifices extending through each of said first

support members, each orifice being directed toward said first planar surface for creating a zone of turbulence in one



of said troughs beneath the lower surface of the solid fuel, and

means for moving air to and through said orifices.

4,515,148

CYLINDRO-PARABOLICAL SOLAR ENERGY COLLECTOR

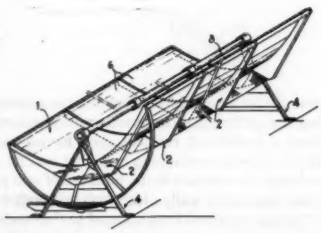
Jean L. M. R. Boy-Marcotte, Orsay; Georges J. Chastang, Lex Clayes Sous Bois; Laurent O. Salvaire, Laval, and Christian D. Burnouf, Montsurs, all of France, assignors to Rossignol S.A., Montsurs and Bertin et Cie, Plaisir, both of, France

Filed Nov. 10, 1982, Ser. No. 440,745

Claims priority, application France, Nov. 12, 1981, 81 21196

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **20 Claims**



13. A solar energy collector comprising a troughlike concave reflector having an axis through the focus of the reflector, a heat absorber tube disposed along and coincident with said axis, a heat transfer fluid circulating in said tube, pivot means pivotably and detachably mounting said reflector on said heat absorber tube, said pivot means comprising frames carrying the reflector and spaced apart along said axis and including arms having end portions defining openings for receiving and removing said tube in a direction radially of said axis, and releasable locking means engaged in said openings for retaining said tube in said openings, said reflector being of cylindro-parabolical shape, said end portions of said arms defining a partly annular fork at the end of each arm and surrounding the absorber tube, and said locking means comprising an element of an insulating material locking each fork on the absorber tube, each frame comprising two identical members of moulded metal, each of which members having a curved side defining the shape of the reflector, said members being assembled in pairs so that the curved sides are in the extension of each other.

4,515,149

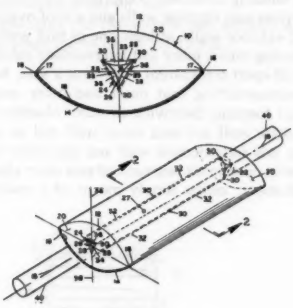
APPARATUS FOR THE COLLECTION OF SOLAR HEAT ENERGY AND A SOLAR COLLECTOR

Carl M. Sgroi, 609 Monroe Blvd., Long Beach, N.Y. 11561, and Klaus M. Hubner, 22 Claurome Pl., Freeport, N.Y. 11520

Filed Nov. 4, 1983, Ser. No. 548,696

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—442 **17 Claims**



1. Apparatus for the collection of solar heat energy and its transference to a fluid media to be heated comprising an elongated housing having a transparent front panel, an arcuate rear panel and a pair of opposed side walls, said rear panel having a reflecting surface directing the solar energy along an elongated line of focus,

an elongated heat collector extending substantially along the line of focus between said side walls,

said heat collector comprising a hollow elongated transparent tubular support and an inner tubular heat exchanger formed of a plurality of curved elongated absorbent sheets in surface engagement along their edges with adjacent sheets to provide outwardly extending elongated projections,

and means for releasably retaining said sheets in surface engagement with the elongated projections thereof spaced in and from said tubular support to define a plurality of heat chambers therebetween, said means spacing each of the projections out of contact with said tubular support to define gaps therebetween for the free circulation and flow of the fluid media between said tubular support chambers, and duct means extending through said side walls respectively for communication with each end of said heat collector for the passage therethrough of a fluid media to be heated.

4,515,150

BUILDING STRUCTURE AND BUILDING PANEL AND METHOD OF CONTROLLING APPEARANCE AND LIGHTING OF A BUILDING

John J. McGlew, and John J. B. McGlew, Jr., both of P.O. Box 823, Tuxedo Park, N.Y. 10987

Continuation of Ser. No. 121,808, Feb. 15, 1980, abandoned. This application Jun. 8, 1983, Ser. No. 502,182

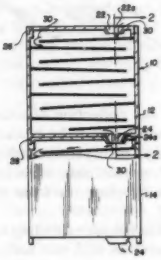
Int. Cl.³ F24J *3/02*

U.S. Cl. 126—445 **11 Claims**

1. Building panel structure which may be interfitted with other panels to form a wall, comprising a structural member for both the interior and exterior of a building wall and roof, comprising outer, inner and intermediate substantially parallel spaced-apart transparent walls and a side, bottom and top wall interconnecting said outer and inner and intermediate walls and forming therewith an outer chamber between said intermediate wall and said outer wall and an inner chamber between said intermediate wall and said inner wall, an outlet and an inlet connected into each of said outer chamber and said inner

chamber, media supply means of a material for selectively changing light transmission, heat transmission, color and appearance of said panel associated with said panel and having a discharge connectible with said inlet to at least one of said chambers and a return connectible to said outlet of the associated chamber, and heat transfer media means connectible to the other of said chambers for conditioning the interior of the building.

6. A building structure comprising exterior walls, interior walls within said exterior walls and a roof overlying said interior and exterior walls, at least one of said walls comprising a panel having outer, inner and intermediate substantially parallel spaced-apart transparent walls and a side, bottom and top wall interconnecting said outer and inner and intermediate walls and forming therewith an outer chamber between said intermediate wall and said outer wall and an inner chamber between said intermediate wall and said inner wall, an outlet and an inlet connected into each of said outer chamber and said inner chamber, media supply means of a material for selectively changing light transmission, heat transmission, color and appearance of said panel associated with said panel and having a discharge connectible with said inlet to at least one of said chambers and a return connectible to said outlet of the associated chamber, and heat transfer media means connectible to the other of said chambers for conditioning the interior of the building.



7. A method of controlling the appearance and lighting of a building having a transparent exterior portion, a transparent interior wall portion within the exterior, and a transparent roof portion, and in using at least one wall defining at least an inner and outer aligned transparent chambers one behind the other, and comprising directing a flowable media through one of the chambers in a quantity and of a characteristic to selectively control the amount of sun light and light passing through the chambers and the color and appearance of the panel and the amount of light which will pass into the interior rooms of the building and circulating a heat transfer media through other of said chambers which will not interfere with the selective control of the flowable media.

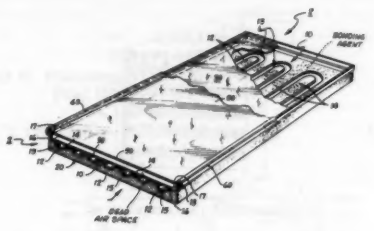
4,515,151

FIBER-REINFORCED CONCRETE SOLAR COLLECTOR

Arthur J. Slemmons, Los Gatos, and Peter J. Newgard, Redwood City, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 27, 1982, Ser. No. 404,272
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—450 **12 Claims**

1. A solar collector comprising a glass member having a solar selective coating on a first surface thereon characterized by high absorption and low emissivity, a shaped concrete member secured to said glass member, said concrete member comprising thin-wall concrete reinforced with alkali-resistant fibers and shaped to provide, in co-operation with said glass member secured thereto, a series of passageways capable of carrying heat exchanging fluid therethrough to a heat exchanger, said solar collector being further characterized by the use of materials having substantially matching thermal expansion coefficients over the temperature range to which solar collectors are normally exposed.

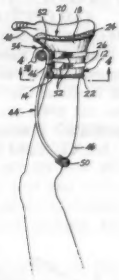


4,515,152

LOAD CENTERING BOOT FOR INVERSE SUSPENSION

Roger C. Teeter, 4106 Snag Island Dr., Sumner, Wash. 98390

Filed May 17, 1982, Ser. No. 379,106
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **5 Claims**



2. An inversion boot adapted for attachment to a person's leg for suspending that person in an inverted position wherein said boot comprises: a preformed resilient shell having normally and automatically closed overlapping ends that may be opened to permit placement on a person at the juncture of said person's foot and leg then to automatically close with said ends overlapping around the leg, a resilient liner secured to the inside of the shell, a buckle secured to an outer surface of the shell, a strap secured at one end to the outer surface of the shell with the other end of the strap extended to permit encircling the overlapping shell and to be adjustably secured in the buckle, and means secured to the shell for transferring the person's weight to an independent support means for suspending the person in an inverted position from the independent support means.

4,515,153

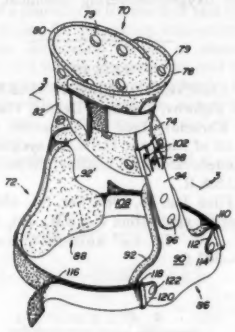
STABILIZER FOR CERVICAL COLLAR

Anthony Calabrese, Philadelphia, Pa., assignor to Charles Greiner & Company, Inc., Westville, N.J.

Filed Aug. 4, 1983, Ser. No. 520,083
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **7 Claims**

1. A cervical collar comprising discrete front and back halves adapted to partially overlap one another, said halves being made from a soft, flexible polymeric plastic material, strap means for securing the halves in overlapping relation, a stabilizer for said collar including a front piece adapted to overlie part of a person's chest and a rear piece adapted to

overlie part of a person's back, adjustable strap means for encircling a portion of a person's body and removably interconnecting said front piece and said rear piece, means on the



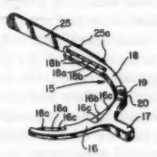
upper end of said front and rear pieces for removably connecting the front and rear pieces to their associated collar half, said last-mentioned means including at least one plastic rivet having a non-circular head and being removable by a hand tool.

4,515,154

METHOD AND APPARATUS FOR INDEXING THE CONDYLE POSITION DURING SAGITTAL RAMUS SPLIT SURGERY

Myer S. Leonard, 1340 Fairlawn Way, Golden Valley, Minn. 55416

Filed Jun. 6, 1983, Ser. No. 501,655
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—92 EB **4 Claims**



1. The method for providing a positive position indexing reference for sagittal ramus split surgery comprising,

providing an indexing template which includes means for adjusting the size thereof to fit different size maxillary arch structures,

placing the template in contact with the front surfaces of the maxillary arch teeth,

conforming the template to the shape and size of the arch,

positively anchoring the template to the teeth of the maxillary arch to provide a fixed reference anchor,

attaching a rearwardly extending indexing paddle to the template in overlapping relation to the ramus,

marking the outer surface of the ramus along the edges of the indexing paddle with a pair of indexing lines to positively indicate the occlusal position and angular relationship of the condyle in the temporal fossa socket,

splitting the ramus into two sections having an overlapping adjustment portion,

adjusting the two sections to correct the abnormal mandible condition,

repositioning the two split-apart ramus sections with the two reference indexing lines realigned with the indexing paddle,

reconnecting the split-apart ramus sections in their corrected occlusal position,

the two split-apart ramus sections being reconnected by a plurality of screws after drilling holes through the overlapping portion of the upper ramus section slightly larger than the diameter of the anchoring screws,

drilling and tapping holes in the overlying lower ramus section aligned with the larger outer holes to threadably receive the screws therein, and

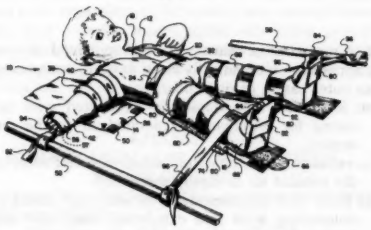
positively attaching the two overlapped sections during the reuniting healing process of the ramus.

4,515,155

INFANT RESTRAINT

Dolores Wagemann, 2075 Rialto Ave., San Bernardino, Calif. 92410

Filed Jul. 11, 1983, Ser. No. 512,666
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—134 **4 Claims**



1. In combination for use with an infant, said infant having a torso from which extends a head, legs and arms with a foot connected to each said leg, each said arm terminating in a hand, a restraint assembly for substantially immobilizing an infant, said restraint assembly comprising:

a vest to be located about said torso, said vest including an opening assembly for permitting ease of accessability to the torso, a disengageable first fastener assembly attached to said vest directly adjacent said opening assembly, said first fastener assembly to be operable to connect together said vest about said opening assembly; and

at least one sleeve attached to said vest and extending therefrom, a said arm adapted to extend through said sleeve, said sleeve including a first splint, said first splint extending the substantial length of said arm, a second fastener assembly connected to said sleeve, said second fastener assembly to be operable to fixedly secure said sleeve onto said arm, whereby said first splint and said second fastener assembly cooperate to maintain said arm in the extended (non-bent at the elbow) position, said sleeve having a free outer end, said free outer end adapted to be connected with said hand, a third fastener assembly attached to said sleeve at said free outer end, a first securing strap removably connected by said third fastener assembly to said sleeve, whereby said first securing strap is to be connected to a separate structure to restrain against movement said arm located within said one sleeve.

4,515,156

REGENERATIVE CANISTER OF A SELF-CONTAINED OXYGEN-BREATHING APPARATUS ON CHEMICALLY FIXED OXYGEN

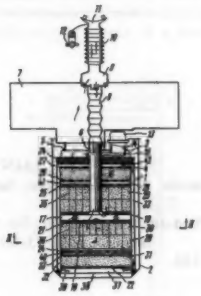
Nikolai M. Khudosovtsev; Jury A. Shevchenko; Anatoly I. Artemenko; Mikhail G. Danilevsky; Vladimir K. Kocherga; Viktor N. Luchko; Anatoly E. Margolis; Vladimir K. Ovcharov; Ljudmila Y. Filimonovna, and Grigory A. Shulman, all of Donetsk, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Gornospasatelngo Dela, Donetsk, U.S.S.R.

Filed Jun. 28, 1983, Ser. No. 508,556

Claims priority, application U.S.S.R., Jan. 17, 1983, 3530204; Mar. 14, 1983, 3558351

Int. Cl.³ A62B *7/08*

U.S. Cl. 128—202.26 **8 Claims**



1. A regenerative canister of a self-contained oxygen-breathing apparatus on chemically fixed oxygen, comprising:

an outer casing having ends;

an inhalation tube fluidically connected with said outer casing for supplying regenerated air to the respiratory organs;

an exhalation tube communicating with said outer casing for the exhaled air to supply thereinto;

an inner shell accommodated in said outer casing and communicating with said exhalation tube, said inner shell having air-permeable ends;

an oxygen-delivering chemical situated in said inner shell between the ends thereof;

a top and a bottom collector space defined between said ends of the inner shell and of the outer casing, a passageway defined between said inner shell and outer casing fluidically communicating said top and bottom collector spaces, and said inhalation tube communicating with said top collector space;

a filter provided in said inhalation tube;

a starting device adapted for initiating the evolution of oxygen by said oxygen-delivering chemical and located on said outer casing;

air-permeable transverse partitions installed substantially in the central portion of said inner shell and subdividing the interior thereof into two compartments; a distributing chamber formed by said transverse partitions and the walls of said inner shell, said chamber communicating with said starting device and said exhalation tube so as to direct the exhaled air from said distributing chamber to said ends of the inner shell through the bulk of said oxygen-delivering chemical;

at least two additional transverse partitions installed in each compartment of said inner shell so as to establish a mixing chamber therebetween and to divide said oxygen-delivering chemical into at least two layers as along the direction of air flow from said distributing chamber to the ends of said inner shell;

heat-distributing elements made of a heat-conducting material and located in each of the compartments of the inner shell in the bulk of said oxygen-delivering chemical on its section running from said distributing chamber to the layer of the oxygen-delivering chemical adjacent to the end of said inner shell for heat distribution and withdrawal from the oxygen-delivering chemical situated on said section.

4,515,157

CORNEAL INCISION MARKER

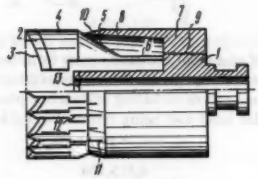
Svyatoslav N. Fedorov; Evgeny I. Degtev; Vladimir N. Golubev; Sergei V. Khromov; Igor A. Yatsenko, and Alexandr A. Karavaev, all of Moscow, U.S.S.R., assignors to Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza, Moscow, U.S.S.R.

Filed Jan. 18, 1983, Ser. No. 458,789

Claims priority, application U.S.S.R., Jul. 28, 1982, 3464601

Int. Cl.³ A61F *9/00*

U.S. Cl. 128—303 R **4 Claims**



1. A device for marking locations for incisions on the cornea of an eye, said device comprising: an elongated, hollow case defining a bush; sight means for centering said device over the cornea, said sight means being positioned within said hollow case; multiple, radially oriented plates having sharpened, curvilinear edges for marking said incision locations on the cornea; means for holding said plates, said holding means having an outer surface and including a tapered surface which tapers inwardly from said outer surface in the direction of said case and away from said curvilinear edges, said holding means having a cylindrical end which is rigidly secured to said case, said plates being mounted on the holding means on an end opposite said tapered surface and extending outwardly of said bush; and drive means movably coupled to said case for engaging said tapered surface of said holding means for providing smooth synchronized movement to radially adjust the positions of said holding means and said plates.

4,515,158

SPEECH PROCESSING METHOD AND APPARATUS

James F. Patrick; Peter Seligman; Yit C. Tong, and Graeme M. Clark, all of Melbourne, Australia, assignors to The Commonwealth of Australia Secretary of Industry and Commerce, Canberra, Australia

Filed Dec. 11, 1981, Ser. No. 329,986

Claims priority, application Australia, Dec. 12, 1980, 6923/80; Jun. 30, 1981, 9509/81

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 R **11 Claims**

1. A signal processing system for converting a speech signal into a data signal for controlling a means for stimulating of a hearing prosthesis for an individual patient, the prosthesis being of the type including an implanted electrode array adapted to stimulate the auditory nerve fibers of a patient by the application of electrical currents to selected electrodes in the array, said processing system comprising

means for receiving a speech signal and for generating an electrical input signal having a plurality of components corresponding to a plurality of formant components of the received speech signal,

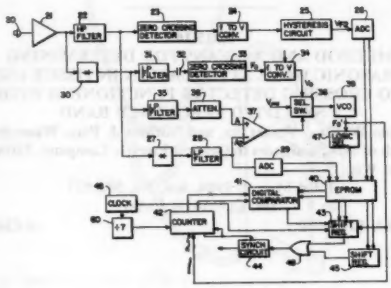
first means for generating from said input signal electrical

signals representative of at least one of the amplitude and frequency of the fundamental voicing component FO of said speech signal,

second means for generating from said input signal electrical signals representative of at least one of the amplitudes or frequencies of a plurality of formants of said speech signal,

programmable means for producing instruction signals for controlling the application of sets of electrical signals selected from said signals generated by said first and second means to selected groups of electrodes in said array with selectable delays between the stimulation of each electrode in each of said groups, said programmable means including

means for storing data representative of a predetermined



relationship between each group of electrodes and a selected range of at least one formant frequency based on psychophysical testing of the patient and data defining a predetermined relationship between another formant frequency and the delay between stimulation of electrodes in each group,

said programmable means further including means for producing instruction signals for determining the level of stimulation of each selected group of electrodes as a function of the amplitude of said formants of said speech signal, and

storage means for generating and storing stimulus signals corresponding to said instructions and for releasing said signals, separated in time by said selectable delays, to said means for stimulating the selected electrodes.

4,515,159

DIGITAL CARDIAC PACEMAKER WITH RATE LIMIT MEANS

Ray S. McDonald, St. Paul; David L. Thompson, Fridley; Martin A. Rossing, Anoka, and Jerome T. Hartlaub, New Brighton, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 170,447, Jul. 21, 1980, abandoned, which is a continuation of Ser. No. 957,960, Nov. 6, 1978, abandoned. This application Mar. 15, 1982, Ser. No. 358,172

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **38 Claims**

1. A medical device pulse generator for providing stimulating pulses to output terminals adapted to being electrically coupled to body tissue, said pulse generator comprising:

clock means for providing a series of clock pulses;

counter means for counting said clock pulses;

first decoding means responsive to said counter means for providing a signal whenever said counter means reaches a first certain count, said first count relating to the time between stimulating pulses;

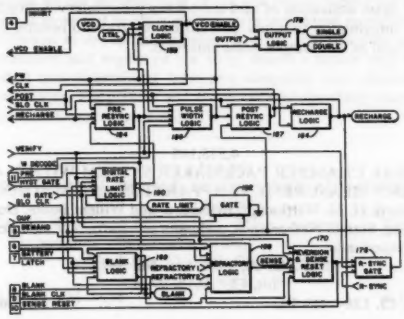
first bistable means for being set in response to said first decoding means signal;

second decoding means responsive to said counter means for providing a signal whenever said counter means reaches a second certain count, said second certain count relating to the minimum acceptable time between stimulating pulses;

second bistable means for being set in response to said second decoding means signal;

gate means responsive to said first and second bistable means for providing a signal when both said first and second bistable means are set;

output means for providing said stimulating pulses in response to said gate means signal;



reset means for resetting said counter means, said first bistable means and said second bistable means in response to the provision of said stimulating pulse; and

override means for providing a signal to enable said gate means to provide a signal whenever said first bistable means is set regardless of the state of said second bistable means, said override means signal only being provided when it is desired to provide stimulating pulses separated by a time period less than the time for said counter means to reach said second count.

4,515,160

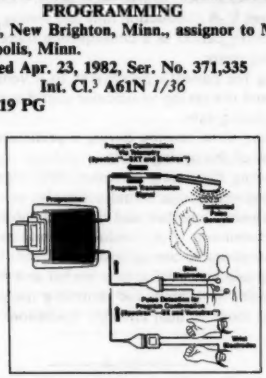
CARDIAC PACEMAKER SYNCHRONIZED PROGRAMMING

John G. Keimel, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 23, 1982, Ser. No. 371,335

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **4 Claims**



1. A method of controlling the output pulse intervals of the pulses emitted by an implantable programmable cardiac pulse generator means which normally operates under the control of a program stored in said pulse generator means comprising the steps of:

(A) transmitting temporary pulse interval program information from a control location to said pulse generator means which specifies the interval between at least one cardiac depolarization event and an ensuing output pulse;

(B) sensing the occurrence of cardiac depolarization events at said control location;

(C) interrupting the control of said pulse interval established by said stored program of said pulse generator means upon the satisfaction of predetermined criteria by said sensed cardiac depolarization event;

(D) utilizing said temporary pulse interval program information to provide the specified interval between said cardiac depolarization events and said ensuing pulses before said ensuing pulses are specified to occur; and,

(E) releasing control of the operation of said pulse generator upon utilization of said temporary pulse interval program information to allow said stored program to resume control of said output pulse intervals.

4,515,161

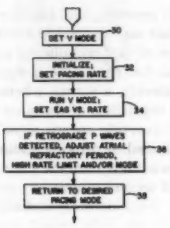
DUAL CHAMBER PACEMAKER SYSTEM WITH V-A TIME MEASUREMENT APPARATUS AND METHOD

Frederik H. M. Wittkampf, Brummen, and Willem Boute, Doesburg, both of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands

Filed Jan. 10, 1984, Ser. No. 569,669

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **14 Claims**



1. In a dual chamber cardiac pacemaker, a method of determining patient V-A conduction time and setting the pacemaker atrial refractory period as a consequence thereof, comprising the following steps:

(a) setting the patient's pacemaker to a ventricular pacing mode and delivering ventricular stimulus signals at a first stable pacing rate;

(b) enabling atrial sensing during a predetermined A sense window of the pacing cycle;

(c) measuring the timing of sensed atrial signals relative to delivered ventricular stimulus signals;

(d) determining whether said timing is substantially stable, and determining V-A conduction time as a function of determined stable timing; and

(e) setting said atrial refractory period as a function of said determined V-A time, and returning the pacemaker to a selected mode of dual chamber operation.

4,515,162

ELECTRODE PAD

Katsuhiro Yamamoto; Katsuo Matsumoto, and Yoshiyuki Okada, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

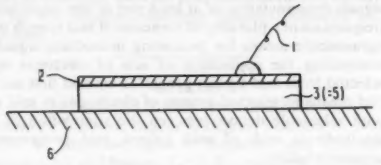
Filed Sep. 14, 1981, Ser. No. 301,861

Claims priority, application Japan, Mar. 14, 1980, 55-33948[U]

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—640 **6 Claims**

1. An electrode pad consisting essentially a tacky cross-linked electrically conductive hydrogel, wherein said hydrogel comprises at least one of polyacrylic acid and polyacrylic acid



salt, water, and a cross-linking compound containing at least two epoxy groups in the molecule.

4,515,163

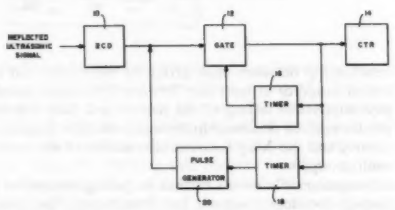
METHOD AND A MEANS FOR DETERMINING ULTRASONIC WAVE ATTENUATION IN TISSUE USING ZERO CROSSING DETECTOR FUNCTIONING WITHIN A SPECIFIED FREQUENCY BAND

Stephen W. Flax, Waukesha, and Norbert J. Pelc, Wauwatosa, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Mar. 2, 1984, Ser. No. 585,527

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **6 Claims**



1. Apparatus for counting zero crossings of an ultrasonic wave for use in a system for determining characteristics of biological tissue comprising:

means for generating a pulse in response to a zero crossing of a signal,

counter means,

gate means for applying said pulse to said counter means,

first means for inhibiting said gate means for a first period of time after a zero crossing, and

second means for generating and applying a pulse to said gate means after a second period of time after a zero crossing,

said first means and said second means being reset after each pulse is passed by said gate means.

4,515,164

DIFFERENTIAL DOPPLER FOR BLOOD FLOW MEASUREMENT

Martin J. Slavin, Dix Hills, N.Y., assignor to Intech Systems Corp., Hauppauge, N.Y.

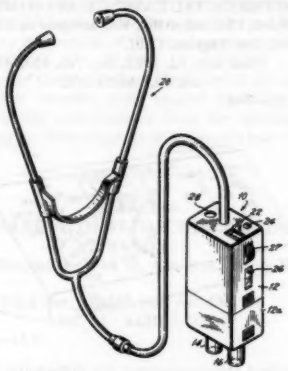
Filed Mar. 23, 1984, Ser. No. 592,490

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—663 **9 Claims**

1. An apparatus for determining whether an occlusion is present in a blood vessel comprising a portable housing, transmitter means supported in said housing for producing an ultrasonic signal of a given frequency, a first probe supported on said housing for directing said ultrasonic signal to a first location in a blood vessel and receiving a reflected ultrasonic signal from said first location, a second probe supported on said housing and spaced a predetermined distance from said first probe for directing said ultrasonic signal to a second location in

said blood vessel spaced from said first location and receiving a reflected ultrasonic signal from said second location, said predetermined distance being chosen so that said first probe is responsive substantially to signals from said first location and said second probe is responsive substantially to signals from said second location, first receiver means supported in said housing for receiving said reflected ultrasonic signal after return from contact with blood flowing in said blood vessel at said first location and for producing a first received signal representative of frequency shift of the received signal, second



receiver means supported in said housing for receiving said reflected ultrasonic signal after return from contact with blood flowing in said blood vessel at said second location and for producing a second received signal representative of frequency shift of the received signal, and difference measuring means supported in said housing for receiving said first and second received signals and for producing a difference signal representative of a measurement of the difference between said first and second received signals whereby a difference in blood flow velocity is determined.

4,515,165

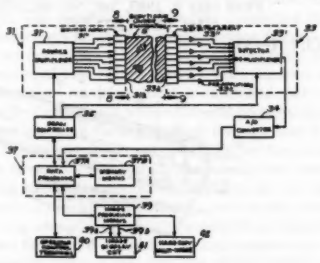
APPARATUS AND METHOD FOR DETECTING TUMORS

Robert Carroll, Gainesville, Fla., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 118,639, Feb. 4, 1980, abandoned. This application Sep. 15, 1981, Ser. No. 302,443

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—664 **51 Claims**



1. A method of detecting the presence of tumors and distinguishing cancerous from non-cancerous tumors in situ within the body of a human being or animal, said method comprising the steps of scanning a test region in said body by individually applying at discrete locations on the skin surface of said body opposite the test region in said body where a tumor may be located a visible or infrared beam of radiation having a tumor-distinguishing wavelength which is absorbed or scattered to a greater degree by a cancerous tumor relative to a non-cancerous tumor and by surrounding normal healthy tissue and which is absorbed or scattered to a lesser degree relative to a non-cancerous tumor than by normal healthy tissue and cancerous tumors, and detecting and measuring the magnitude of the radiation emanating from the skin surface of the body at a discrete point of the skin surface no greater than 2 mm thereacross on the opposite side of the test region where the radiation is expected to emanate for each individual application of radiation as the radiation being directed into the skin surface irradiates said region of the body where a tumor may be located and determining from said detecting and measuring if any tumors are present and if present distinguishing cancerous from non-cancerous tumors.

4,515,166

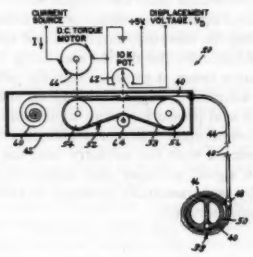
NOCTURNAL PENILE TUMESCENCE AND RIGIDITY MONITOR

Gerald W. Timm, Minneapolis, Minn., assignor to Dacomed Corporation, Minneapolis, Minn.

Filed Jun. 13, 1983, Ser. No. 503,872

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—694 **19 Claims**



1. A penile rigidity and tumescence monitor apparatus, comprising:

(a) transducer means for providing output signals indicative of penile rigidity and tumescence throughout a penile tumescence event; and,

(b) control means operatively interconnected to said transducer means for providing control of said transducer means, said control means further providing for acquisition of said out put signals.

4,515,167

DEVICE FOR THE DEVELOPMENT, TRAINING AND REHABILITATION OF THE PUBOCOCCYGEAL AND RELATED PERINEAL MUSCULATURE OF THE FEMALE

Joel S. Hochman, 121 Sandoval St., Santa Fe, N. Mex. 87501

Filed Feb. 28, 1983, Ser. No. 470,196

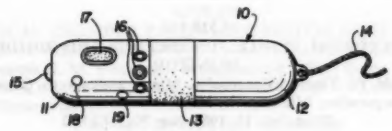
Int. Cl.³ A61B *10/00;* **A61N** *1/36*

U.S. Cl. 128—736 **4 Claims**

1. A device for monitoring CSV and temperature to thereby predict ovulation and fertility periods comprising a casing having a size and shape whereby it can be contained bodily and entirely within the vagina, the casing including metallic parts on the exterior surface thereof adapted to serve as a dipole

antenna, an integrated circuit inside of the casing including a signal averager and comparator, said integrated circuit also including an antenna matching network connected with said metallic parts, and CSV and temperature sensing transducers on the casing and adapted to contact the vaginal wall and being electrically connected with said integrated circuit.

2. A stimulating and monitoring device adapted to be entirely contained in the vagina comprising a casing including metallic parts on the exterior surface of the casing serving as electrodes and being adapted to contact the vaginal wall, the metallic parts also serving as a dipole antenna, circuitry including a power source and means to generate electrical stimulation to the vaginal wall through the metallic parts contained in said casing, said circuitry including a programmable timer, a pressure-sensing signal emitting element, a pressure feedback



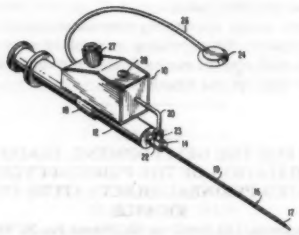
signal processor connecting the programmable timer and the pressure-sensing signal emitting element and an antenna matching network connected to said metallic parts, a manual switch operably mounted on the exterior of the casing and connected to the programmable timer to energize said circuitry, programming switches operably mounted on the exterior of the casing for regulating the intensity, amplitude and time period of stimulation produced by the device and being connected to said programmable timer, a pressure sensing yielding element on the casing adapted to engage the vaginal wall and being connected with said pressure-sensing signal emitting element, and CSV and temperature transducer elements on the casing and being connected with the circuitry, and the circuitry further including a signal averager and comparator for the signals delivered by said transducer elements and being connected to said matching network.

4,515,168

CLAMP-ON NERVE STIMULATOR AND LOCATOR

Martin H. Chester, 25310 Tierra Grande Dr., Carmel, Calif. 93921, and Cary A. Norman, 440 Juniper Ave., Pacific Grove, Calif. 93950

Filed Jul. 22, 1983, Ser. No. 516,213
Int. Cl.³ A61H *39/02*; A61N *1/32*
U.S. Cl. 128—741 **9 Claims**



1. A nerve stimulator/locator unit for applying current pulses to a patient's body through an injection needle connected to a syringe, said unit comprising:

a housing;

pulse generator means mounted in said housing for generating a series of output current pulses;

indicator means mounted on said housing for producing a visual indication of the generation of each pulse;

manually controlled current-adjusting means mounted in said housing for adjusting the current values of the pulses;

connector means for electrically connecting the output of said pulse generator means to an injection needle; and

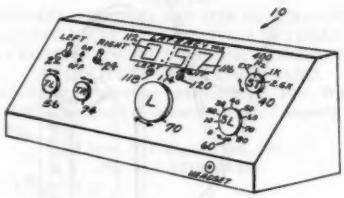
clamping means, fixed to said housing, for clamping said housing directly to a syringe.

4,515,169

DIFFERENTIAL LATENCY AUDIOMETER

John W. Ward, Charlottesville, Va., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 12, 1982, Ser. No. 433,641
Int. Cl.³ A61B *5/12*
U.S. Cl. 128—746 **41 Claims**



1. A method for determining the differential interaural latency of a subject comprising the steps of:

applying a first complex sound signal to a first ear of said subject;

applying, simultaneously with the application of said first signal, a second complex sound signal to the second ear of said subject, said second sound signal corresponding to said first sound signal, but offset in time with respect to said first sound signal;

varying the time offset of said second signal until the apparent source of said sounds is perceived by said subject as in the vicinity of a predetermined position within the interior of said subject's head; and

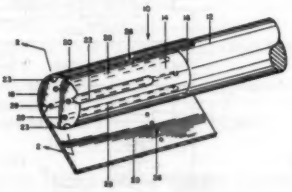
deriving indicia of differential interaural latency from said varied time offset.

4,515,170

VENTILATED MOUTHPIECE FOR A SMOKING ARTICLE

Daniel V. Cantrell, and Robert A. Sanford, both of Prospect, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 9, 1983, Ser. No. 492,978
Int. Cl.³ A24D *3/04*
U.S. Cl. 131—336 **16 Claims**



1. A ventilated mouthpiece for a cigarette, comprising:

a generally cylindrical core member fabricated entirely out of an air and smoke impermeable material, the core member having a smoke inlet end and mouth end;

means defining a plurality of ventilating air flow channels extending along at least a portion of the core member, the

air flow channels being open to the mouth end of the core member providing for the flow of only ventilating air therethrough to the outside of the core member at the mouth end;

means providing for the flow of only ventilating air into the ventilating air flow channels;

means defining a plurality of linear, cylindrically shaped smoke flow capillaries extending through the core member from the smoke inlet end to the mouth end of the core member, each smoke flow capillary being open to the smoke inlet end of the core member and open to the mouth end of the core member providing for the flow therethrough of only smoke from the inlet end of the core member to the outside of the core member at the mouth end; and

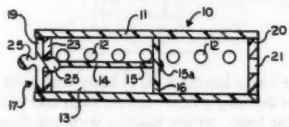
the openings of the smoke flow capillaries at the mouth end of the core member being spaced inwardly generally radially of the core member from the openings of the ventilating air flow channels at the mouth end of the core member.

4,515,171

HAIR CURLER WITH RETRACTABLE RETAINING BAND

Patricia T. Thibodeaux, 6544 St. Ann Ave., Baton Rouge, La. 70811

Filed Oct. 3, 1983, Ser. No. 538,501
Int. Cl.³ A45D *2/00*
U.S. Cl. 132—42 R **1 Claim**



1. A hair curling apparatus comprising:

a. a hollow two ended tubular body member about which hair can be wound to form a curl, said tubular body member having a first end and second end, said hollow tubular body member having a first cover on said first end and a second cover on said second end, each of said two covers having a hole therein, said two covers being parallel, said tubular body having a connecting member located between said two covers and inside said tubular body member,

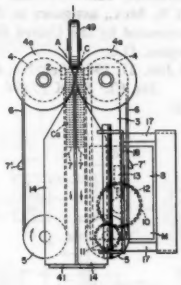
b. an elastic hair retaining band having a first end and a second end, said first end of said elastic hair retaining band being connected to said connecting member on the inside of said hollow tubular body member, the second end of said elastic hair retaining band having connected thereto attachment means having tab means thereon for attaching said second end of said elastic hair retaining band to said second cover of said hollow tubular body member when said elastic hair retaining band is stretched outwardly from said first end of said hollow tubular body means, said elastic hair retaining band extending through said hole in said first cover, said tab means being adapted for receipt in said hole in said second cover, said elastic hair retaining band being adapted to completely retract into the interior of said hollow tubular body member, said elastic retaining band having a length sufficient to extend from the point at which said first end is connected to said connecting member outwardly through said first end of said hollow tubular body over the surface of said hollow tubular body member to said second end of said hollow tubular body means, and to retract completely into the interior of said hollow tubular body member, said hollow tubular body member having holes in the outer surface thereof communicating with the interior thereof.

4,515,172

COIN STACKING APPARATUS FOR A COIN PACKAGING MACHINE OR THE LIKE

Minoru Nakamura, and Kazuto Asami, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Oct. 25, 1982, Ser. No. 436,480
Claims priority, application Japan, Oct. 28, 1981, 56-171386
Int. Cl.³ G07D *9/04*
U.S. Cl. 133—8 A **7 Claims**



1. A coin stacking apparatus for stacking vertically in a stacking space a plurality of coins fed horizontally along a coin passage in a coin disposing machine such as a coin packaging machine or the like; said stacking space having an upper end where coins are received from the coin passage and a lower end which is released after a predetermined number of coins have been stacked so that the stacked coins discharged from the stacking space, comprising:

(a) a pair of endless belts disposed substantially vertically and having inner vertical travelling portions, respectively, which are opposite to each other to define the sides of the stacking space with a certain distance kept therebetween, the inner vertical travelling portions being moved downwardly together with each other,

(b) belt guides means for guiding the endless belts so as to form the inner vertical travelling portions, said belt guide means having at least two pulleys which are located opposite to each other in upper portions of the respective inner vertical travelling portions so that the opposite portions of the respective endless belts running along the pulleys provide a coin-receiving region at the upper end of the stacking space,

(c) at least two coin supports fixedly secured to each of said belts respectively in a symmetrical relationship with respect to the axis of the stacking space, said coin supports on the opposite inner vertical travelling portions being cooperable with each other in pairs to support the lower end of a stack of coins,

(d) first coin locating means for locating the foremost end of each coin conveyed horizontally exactly above the stacking space, said first coin locating means being positioned at the front of the stacking space between the belts,

(e) second coin locating means positioned at rear of the stacking space between the belts,

(f) coin guide means extending over the coin-receiving region for guiding the upper surface of each coin which is delivered into the stacking space,

(g) said inner travelling portions of the belts being movable downwardly in response to the introduction of each coin into the stacking space, and driving means operable after a predetermined number of coins have been stacked in the stacking space to move the endless belts so that first said supports holding the lower face of the stacked coins move downwardly to permit the discharge of a stack of coins from the stacking space and second said supports move into positions ready for receiving the next coins intro-

duced from the coin passage into the coin-receiving region of the stacking space, and

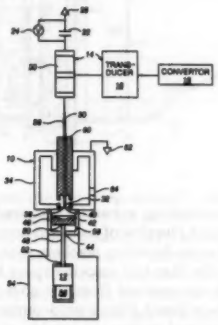
(h) shutter means at the lower end of the stacking space for receiving the stacked coins, said shutter means being movable to an open position to permit the discharge of a stack of coins from the stacking space.

4,515,173

FAST SHUTTER APPARATUS

Eugene L. Zimmermann, Santa Fe, and Don R. Kania, Los Alamos, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1984, Ser. No. 625,322
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **7 Claims**



1. An apparatus for providing protection from blast damage by rapidly interposing a shutter between an area to be protected and the blast area, said apparatus comprising:

a. sensor means for sensing a trigger signal associated with the blast and for converting the trigger signal into a voltage pulse of sufficient magnitude to create a discharge;

b. a firing pin for receiving said voltage pulse, said firing pin having first and second ends, said first end being electrically connected to said sensor means;

c. a pressure chamber holding a first gas under pressure, said pressure chamber having a portion defining an orifice, said pressure chamber disposed about and having said orifice disposed beneath said second end of said firing pin;

d. an insulator disposed around and separating said firing pin from said pressure chamber;

e. a metal foil member sealably covering said orifice of said pressure chamber;

f. a drive housing connected to said pressure chamber, said drive housing having a portion which encloses said orifice and having a portion defining a drive housing aperture, said drive housing aperture located opposite from said foil member;

g. a drive piston disposed within and sealably engaging said drive housing, said drive piston being slidable within said drive housing from a first position adjacent said foil member to a second position spaced apart from said foil member;

h. a drive rod having first and second ends, said first end being connected to said drive piston, said drive rod being slidably passable through said drive housing aperture;

i. a shutter housing having a portion defining a shutter aperture, said shutter housing being disposed beneath said drive housing; and

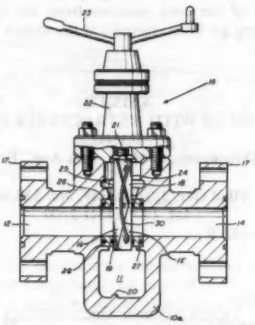
j. a shutter for moving from an open position to a closed position to cover said shutter aperture, said shutter being connected to said second end of said drive rod, whereby after said sensor means receives a trigger signal and converts it into said voltage pulse, said voltage pulse passes from said first end to said second end of said firing pin and a point-to-plane discharge occurs rupturing said foil member, allowing said first gas in said pressure chamber to enter said drive housing and move said drive piston from said first position to said second position, moving said shutter into said closed position to cover said shutter aperture.

4,515,174

GATE VALVE WITH INTERNAL PRESSURE RELIEF MEANS

F. Harold Hollister, Houston, and Danny S. Meyer, Richmond, both of Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 27, 1983, Ser. No. 565,550
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—72 **6 Claims**



1. In a gate valve having a valve body with inlet and outlet flow passages defining a flow way through said valve, a valve chamber in the body communicating with said flow passages, opposed aligned valve seats in said valve body surrounding the inlet and outlet flow passages and exposed to said valve chamber, an expansible ported gate assembly movably mounted in the valve chamber for rectilinear movement across said flow way between a first position wherein the valve is open and a second position wherein the valve is closed, said assemblage including ported juxtaposed gate and segment members having parallel outer sealing surfaces and ports for alignment with said flow passages when the valve is open; and means for moving said gate and segment members into sealing engagement with said valve seats in the open and closed positions of the valve, the improvement comprising:

pressure relief means installed in said segment member for relieving excessive fluid pressure from the valve chamber into the inlet flow passage at a predetermined temperature, said pressure relief means including a passage extending from the port through the segment to the sealing face of the segment at a location which is exposed to said inlet flow passage when the gate assemblage is in the valve closed position;

an internal annular shoulder formed in the wall of said passage intermediate the ends thereof and providing a valve seating surface within the passage, said passage having a first counterbore section extending from the sealing face of the segment to said valve seating surface and a second section extending from the port in the segment to said first section;

a valve element normally disposed in seated engagement with said valve seating surface and blocking said passage;

a perforated retainer element installed in the first counterbore section of said passage in spaced relation to said valve element; and

a plug of eutectic material filling the remainder of the first counterbore section between said retainer element and said valve element and holding the valve element in seated

engagement against said valve seating surface, said plug being adapted to melt at a preselected temperature whereby upon the temperature of the valve chamber reaching said preselected temperature a greater fluid pressure in the valve chamber will force the eutectic material from said passage through the perforated retainer element into the upstream flow passage to relieve said valve chamber, said valve element being pressure energizable in response to a subsequent leak from the valve chamber or the downstream seal to block said passage and allow the valve to provide an upstream seal.

4,515,175

CONTROL IMPULSE INTENSIFIER

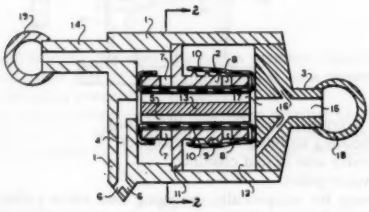
Rolf Nolting, and Bernhard Siniza, both of Bad Freienwalde, German Democratic Rep., assignors to VEB Ingenieurbuero fuer Meliorationen, Bad Freienwalde, German Democratic Rep.

Filed Mar. 18, 1982, Ser. No. 359,537

Claims priority, application German Democratic Rep., Apr. 9, 1981, 2291107

Int. Cl.³ F16K *11/00*

U.S. Cl. 137—107 **4 Claims**



1. A control impulse intensifier for an impulse fluid flow system adapted to be situated between a supply line and a pipe line, comprising

a housing situated between the supply line and the pipe line, said housing having an outflow passage therein,

a hollow valve element situated inside the housing to define an inner valve space inside the valve element communicating with both the outflow passage and the pipe line and an outer valve space between the housing and the valve element, said hollow valve element including a sealing flange outside thereof so that the outer valve space is divided into a supply side communicating with the supply line and a pipe side communicating with the pipe line, at least one first boring passing through the valve element at the supply side, and at least one second boring passing through the valve element at the pipe side, said second boring having means to prevent fluid from passing therethrough from the outer valve space of the pipe side,

flexible cylindrical means situated at least inside the hollow valve element to be located beneath the first and second borings, and

a valve core situated inside the flexible cylindrical means in the hollow valve element, said valve core having at least one path outside the valve core so that when fluid pressure of the supply line is higher than that of the pipe line, fluid in the supply line flows to the pipe line by passing through the first boring and then through a space between the hollow valve element and the flexible cylindrical means and extending from the first boring to the second boring and finally through the second boring to thereby block the path outside the valve core by means of the flexible cylindrical means being inflated inwardly by the fluid, and when fluid pressure of the supply line is lower than that of the pipe line, fluid in the pipe line passes through the path outside the valve core and exits from the outflow passage.

4,515,176

SOLENOID OPERATED PRESSURE REGULATION

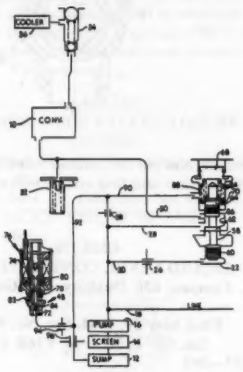
James P. McCarthy, Inkster, and Richard E. Byler, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01060, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982, PCT Pub. No. WO84/00627, PCT Pub. Date Feb. 16, 1984

PCT Filed Aug. 4, 1982, Ser. No. 425,193

Int. Cl.³ G05D *16/00*

U.S. Cl. 137—115 **7 Claims**



1. A line pressure regulation system for regulating fluid pressure in a hydraulic line comprising:

a source of pressurized fluid connected to the hydraulic line;

an orifice communicating with the outlet of the fluid pressure source having a predetermined pressure drop thereacross, the orifice being normally closed, the outlet of the pressure source being opened to vent when the orifice is opened;

a second orifice of fixed size in parallel with the first orifice across which the outlet of the pressure source is communicated to vent; and

an electrical solenoid adapted to open and close the first orifice.

4,515,177

MOLDED CONNECTION PIECE

Alfred Thalmann, and Fritz Reich, both of Uhwiesen, Switzerland, assignors to George Fischer Limited, Schaffhausen, Switzerland

Filed Apr. 26, 1983, Ser. No. 488,650

Claims priority, application Switzerland, Apr. 29, 1982, 2638/82

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—318 **17 Claims**

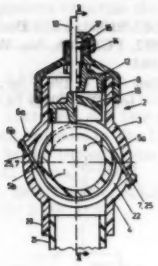
1. A molded connection device for connecting a conduit with a pipeline, comprising:

first and second connection members, each of said connection members having a surface shaped to mate with and partially surround the pipeline;

cutting means, mounted in said first connection member, for penetrating said pipeline and forming a hole only in one wall of the pipeline; coupling means, attached to said second connection member for connection to a conduit; and

an annularly extending channel in said connection members providing fluid communication between the hole and the

conduit and permitting flow of fluid from the interior of the pipeline, through the hole and said annularly extending channel and out the conduit when the cutting means is withdrawn into said first connection member.

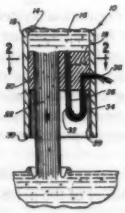


4,515,178

LIQUID LEVEL CONTROL DEVICE

Daniel N. Campau, 656 Duxbury Ct., Grand Rapids, Mich. 49506

Filed May 29, 1984, Ser. No. 614,550
Int. Cl.³ F15C *1/14*; F16K *21/18*
U.S. Cl. 137—393 **17 Claims**



1. A fluid amplifier adapted for sensing the level of a liquid in a reservoir, storage tank or other container and for generating a differential in pressure signal in response to the static presence of the liquid level at a predetermined level, comprising:

inlet means for developing a liquid flow stream;

an access region downstream of said inlet means;

first passage means in communication with said inlet means and of major cross-sectional dimensions for delivering a major portion of said flow stream through said access region to said reservoir, storage tank or other container;

second passage means in communication with said inlet means for receiving a portion of said flow stream, said second passage means being of minor cross-sectional dimensions spaced laterally of said first passage means for developing a liquid power stream through said access region independent of and generally parallel to said major portion of the flow stream delivered by said first passage means;

sensing means responsive to said static presence of the liquid level at said predetermined level for altering said liquid power stream from said generally parallel condition; and

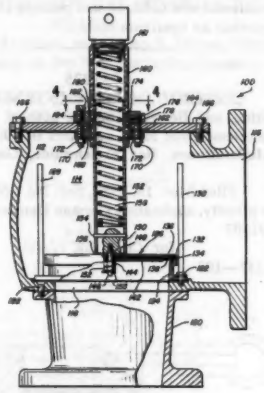
signal developing means for receiving a fluid pressure signal of one magnitude when said liquid power stream is generally parallel and of a second magnitude when said liquid power stream is altered from said generally parallel condition.

4,515,179

PRESSURE RELIEF VALVE WITH ADJUSTMENT FOR SET PRESSURE

Robert H. Edmunds, Glenview, and Jay D. Vanek, Brookfield, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Jan. 28, 1983, Ser. No. 461,752
Int. Cl.³ F16K *15/06*
U.S. Cl. 137—543.13 **16 Claims**



1. A pressure relief valve, comprising:

a housing defining a valve chamber,

a valve seat in said chamber,

a valve pallet,

means for reciprocally mounting said valve pallet in said chamber and aligning said valve pallet to engage said valve seat in a valve closed position,

means for biasing said valve pallet into engagement with said valve seat,

means for retaining said biasing means, said retaining means movable into and out of said chamber,

a stop member releasably secured on said retaining means, said stop member including a locking element locking said stop member to said retaining means, and means for releasably securing said stop member to said housing, said releasably securing means extending through said stop member and movable relative to said stop member into and out of engagement with said housing.

4,515,180

VALVE FOR SELF-PRIMING PUMP SYSTEM

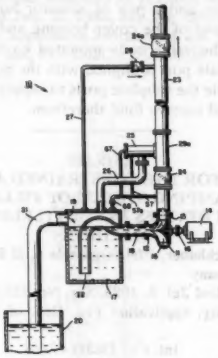
Pellegrino E. Napolitano, Middletown, N.J., assignor to Hudson Engineering Company, Bayonne, N.J.

Filed Dec. 9, 1982, Ser. No. 448,235
Int. Cl.³ B63 *1/00*
U.S. Cl. 137—565 **17 Claims**

1. In a self-priming pump system for a liquid pump having a fluid inlet and a fluid outlet, a suction tank for the liquid to be pumped, the suction tank being in communication with the pump inlet, a discharge line connected to the pump outlet, a check valve positioned in the discharge line downstream of the pump outlet a distance sufficient to provide a column of priming liquid of a quantity sufficient for priming the pump upon loss of suction at the pump inlet, and a priming valve positioned between the pump outlet and the check valve and having an inlet in communication with the discharge line and an outlet in communication with the suction tank, the priming valve responsive to liquid flow from the pump to automatically permit flow of the priming column of liquid from the discharge line to the suction tank, the improvement comprising:

a. a second check valve positioned between the priming valve and the pump outlet to define a quantity of liquid

between said check valves when flow through the pump ceases, said priming valve including a piston operated valve member having a rod connected to said piston, one face of said piston exposed to the discharge line static pressure at a point upstream of said second check valve



and forming one wall of a piston pressure chamber, and the other side of said piston exposed to a pressure not exceeding atmospheric pressure;

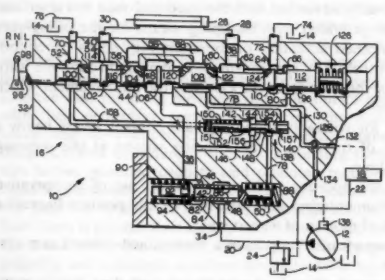
b. a conduit extending from said piston pressure chamber to said suction tank, and control valve means positioned in said conduit to control the flow of liquid therethrough.

4,515,181

FLOW CONTROL VALVE ASSEMBLY WTH QUICK RESPONSE

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 25, 1983, Ser. No. 497,985
Int. Cl.³ F15B *13/02*
U.S. Cl. 137—596 **9 Claims**



1. In a valve assembly (16) adapted for use in a fluid system (10) having an actuator (26) and a source (12) of fluid pressure each respectively connected to the valve assembly (16), said valve assembly (16) having a housing (32) defining an inlet port (34), a supply passage (36) and a work port (38,40); a valving element (96) located in the housing (32) and movable between a neutral position and an actuated position to selectively interconnect the supply passage (36) and the work port (38,40); a flow control element (82) located in the housing (32) and movable between a closed position, an infinite number of fluid metering positions and a full open position to controllably interconnect the inlet port (34) and the supply passage (36); a spring chamber (50) defined in the housing (32) at one end of the flow control element (82) with a spring (88) located therein to bias the flow control element (82) towards the full open position; said flow control element (82) being movable toward the closed position in response to fluid pressure in the supply passage (36) acting on the other end of the flow control element (82); and a load sensing passage (78) defined in the housing (32) to communicate a load pressure signal in the work port (38,40) with the spring chamber (50), the improvement comprising:

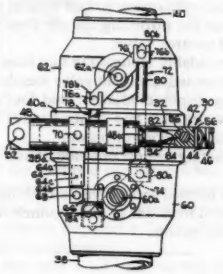
means (138) for blocking the load sensing passage (78) between the work port (38,40) and the spring chamber (50) and interconnecting the spring chamber (50) with one of the inlet port (34) and the supply passage (36) in response to the load pressure signal in the load sensing passage (78) from the work port (38,40) being below a predetermined pressure level.

4,515,182

PIPE COUPLING WITH VALVE CLOSURE SAFETY SYSTEM

Eugene R. LeDevehat, Saligny, France, assignor to FMC Corporation, Chicago, Ill.

Filed Nov. 19, 1982, Ser. No. 443,100
Int. Cl.³ F16L *23/04, 37/28*
U.S. Cl. 137—614.06 **14 Claims**



1. A quickly and safely releasable pipe coupling assembly for connecting together opposed flange ends of two pipe sections, at least one of said pipe sections including a valve with a flow control element and a stem for rotating said element between open and closed positions, said coupling assembly comprising:

(a) a plurality of arcuate segments with means for securing the flanged pipe ends together;

(b) pivot means interconnecting the arcuate segments to form a collar having two connectable end portions;

(c) collar release means functionally associated with the end portions for releasably securing said end portions together;

(d) first fluid power means functionally associated with the collar release means and the valve for releasing the end portions from each other; and

(e) means for preventing actuation of the collar release means by the first fluid power means unless the valve flow control element is in its closed position.

4,515,183

PNEUMATIC CONTROL VALVE

Werner Reiffert, Bochum; Dieter Peters, Witten, and Joachim Wiendahl, Dortmund, all of Fed. Rep. of Germany, assignors to J. D. Neuhaus, Witten, Fed. Rep. of Germany

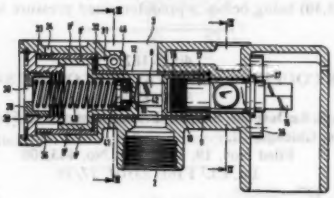
Filed Apr. 12, 1983, Ser. No. 484,214
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3215290
Int. Cl.³ F16K *11/00*
U.S. Cl. 137—625.21 **14 Claims**

1. A pneumatic control valve for controlling the forward

motion and reverse motion of a pneumatically driven apparatus comprising:

a valve housing having a longitudinal bore with a rotary slide valve member mounted therein to be rotatable and axially slidable within said bore, said housing having four connections formed therein each communicating with said bore including a compressed air supply inlet, first and second channels and a scavenging air line, said connections lying substantially in a common plane disposed transversely of the axis of said bore;

said valve member having a valve portion formed to connect said compressed air supply inlet with one of said first or second channels while the other of said channels is vented



lpast said valve portion to said scavenging air line connection and a shut-off portion in said bore at one end of said valve member for throttling the air flow stream passing through said control valve;

a control piston sidably mounted in said bore axially aligned with and connected with said valve member, said shut-off portion being disposed adjacent said four connections to throttle flow through said control valve in response to movements of said control piston;

biasing means acting against one side of said control piston; and

passage means formed in said valve housing to selectively apply pressured from one of said channels to the other side of said control piston.

4,515,184

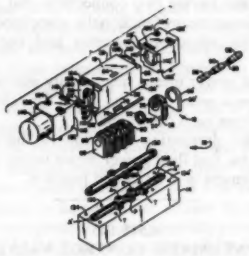
MODULAR DIRECTIONAL VALVE

Norris Bownass, Burgess Hills, and Donald J. Clarkson, Wokingham, both of England, assignors to Abex Corporation, Stamford, Conn.

Filed Jul. 18, 1983, Ser. No. 514,741

Int. Cl.³ F16K *27/04*

U.S. Cl. 137—625.66 **10 Claims**



1. A multi-port, spool type, directional valve and a subplate for mounting the valve, characterized by the valve comprising a cover housing having a plurality of parallel, laterally spaced slots formed in its inner surface; a plurality of individual port modules each having a pair of parallel side walls, a bottom surface, a lateral spool bore which opens into each side wall, a longitudinal port bore one end of which opens into the spool bore and the other end opens into the bottom surface of the module, an outer surface, and a rib formed on the outer surface of each module such that the outer surface of a module is complementary with the inner surface of the cover housing and the module rib is received in a cover housing slot; a plurality of spool seals each adapted to be inserted between adjacent port modules and to surround the spool bores; a longitudinally extending spool inserted through the spool bores, wherein movement of the spool causes the operating position of the valve to change; and a pair of actuator housings each connected to one end of the cover housing and mounted on the subplate; and the valve body mounted on the subplate such that each subplate port is aligned with the port bore of a port module to enable the subplate ports to supply pressure fluid to the modules and receive fluid therefrom.

4,515,185

APPARATUS FOR THE CONSTRAINED ACTUATION OF THE CLAMPING SYSTEM OF FILLING-YARN INSERTION DEVICES IN SHUTTLELESS WEAVING MACHINES

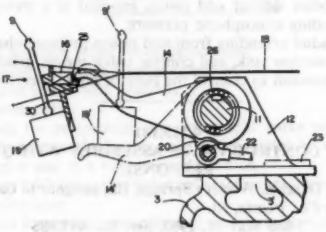
Florian Windischbauer, Pfeiffergässele 6, D 8990 Lindau, Fed. Rep. of Germany

Filed Jul. 5, 1983, Ser. No. 510,833

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224708

Int. Cl.³ D03D *47/18*

U.S. Cl. 139—446 **9 Claims**



1. In an apparatus employed in a shuttleless weaving machine wherein filling-yarn is inserted by gripper systems which are bilaterally advanced into the shed and then retracted and which are provided with clamping means for the filling-yarn for constrained actuation of the clamping means by control levers controlled by cam means and entering through the warp threads of the shed from the exterior, the improvement which comprises:

means for rotatably mounting said control levers below a path of travel of a fabric being woven at the weaving machine;

means for pivoting said control levers out of an operative position entering said shed into an idle position beneath a path of motion of a reed stay;

said cam means comprising a constrained-control cam system;

said constrained-control cam system including cam devices;

a control shaft extending beneath said path of travel of said fabric;

means for mounting said cam devices on said control shaft;

control means arranged bilaterally of the weaving machine for processing ends of said filling-yarn before and after said filling-yarn is inserted into the shed;

said rotatably mounting means comprising pivot bearings provided for said control levers;

sensing rolls cooperating with each of the control levers;

said cam devices each comprising a double eccentric mounted on said control shaft;

means for mounting said pivot bearings such that an axis thereof is parallel to said control shaft; and

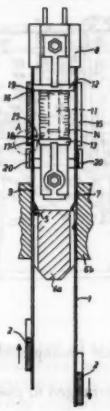
each said control lever including two arms for contacting said double eccentric through said sensing rolls.

4,515,186

LOOM HEALD CONTROL MEANS

Gerard A. Durville, Gipf-Oberfrik, and Robert R. Bucher, Frick, both of Switzerland, assignors to Textilma Ag, Switzerland

Filed Jun. 22, 1983, Ser. No. 506,771
Claims priority, application Switzerland, Jul. 1, 1982, 4025/82
Int. Cl.³ D03C *13/00, 3/08*
U.S. Cl. 139—455 **10 Claims**



1. An improved loom heald control means for operating the warp healds of a loom, specifically of a Jacquard machine, including two rods mounted at one end to the wire, which said two rods are reciprocable between an upper and a lower position, including further flexible rod retaining members supported at one end in a supporting means and operative to retain said rods in their respective end positions, the rods and their corresponding retaining members having complementary shaped engaging sections located at the respective free ends of said rods and said retaining members, which engaging sections are movable into and out of engagement relative to each other, and including an electromagnet located between said retaining members and supported by said supporting means and operative to deflect said retaining members relative to said rods such to move said retaining members into and out of engagement with their respective corresponding rod, the improvement comprising an I-shaped core of said electromagnet having flange sections of differing widths, comprising further armature bodies mounted each to said retaining members and located and arranged such that said armature bodies abut on the one hand the broader of said flange sections and on the other hand there is provided an air gap each between the said respective armature bodies and the narrower of said flange sections, whereby said retaining members are deflectable by the movement of said rods in a direction towards said electromagnet in order to adjust said air gap between said narrower flange section and said armature bodies to a predetermined value.

4,515,187

COMPOUND DISPENSING METHOD AND APPARATUS

Edward G. Schaumburg, Askov, and Eugene F. Stanefski, South St. Paul, both of Minn., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed May 7, 1982, Ser. No. 375,802
Int. Cl.³ B65B *3/06*; H01M *7/00*
U.S. Cl. 141—1 **35 Claims**

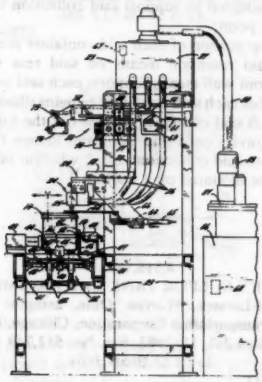
1. A method of controlling a compound dispenser having at least one filler head with an outlet for dispensing compound into a container having relative movement past the dispenser, the container having a plurality of sections separated from each other by partition walls, the container being positioned on conveyor means such that the container and dispenser have relative movement, comprising the steps of:

(a) locating the container in a filling position wherein a first container section is aligned with the filler head;

(b) detecting the position of an accurately aligned container in the filling position adjacent the filler head;

(c) clamping said container to prevent movement thereof from said accurately aligned filling position;

(d) causing the filler head to dispense viscous compound in



a first direction from the filler head into said first container section of the clamped container while moving the filler head horizontally relative to the container section from a start position in a second direction transversely of said first direction to dispense a layer of viscous compound onto the bottom thereof;

(e) moving the filler head back to the start position upon completing the dispensing of a layer of compound in the first container section;

(f) moving the filler head into alignment with a second container section; and

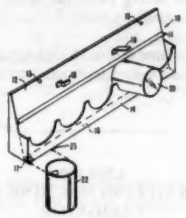
(g) causing the filler head to similarly dispense a layer of viscous compound in the second container section.

4,515,188

DRAIN APPARATUS

James W. Brutsman, 414 W. Allison Rd., Cheyenne, Wyo. 82007

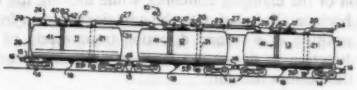
Filed Jun. 14, 1983, Ser. No. 504,259
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **17 Claims**



9. Apparatus for draining fluid from a plurality of containers of the type having an opening at the top thereof and for collecting said fluid in a collection vessel, said apparatus comprising:

(a) rear wall means having forwardly projecting retention means;
(b) front wall means spaced from said rear wall means, wherein the top edge of said front wall means is horizontally disposed with respect to said apparatus; and wherein said top edge includes notches therealong which are adapted to receive a side of each said container;
(c) a floor extending between said rear wall means and said front wall means, wherein said floor is sloped to a drain point;
(d) drain means in said floor at said drain point which is adapted to permit said fluid to drain through said floor;
(e) supporting means carried by the underside of said floor which is adapted to support said collection vessel below said drain point;
wherein the top portion of each said container is engaged and retained by said retention means on said rear wall means, wherein the front wall means supports each said container in a manner such that each said container remains tilted sufficiently for fluid in each said container to flow out the top thereof by the force of gravity onto said floor and thence through said drain means into said collection vessel; wherein said apparatus is adapted to be mounted on a wall.

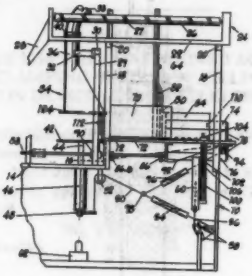
4,515,189
MOLTEN SULFUR TANK CAR ASSEMBLY
Erling Mowatt-Larssen, Warren, Ohio, assignor to General American Transportation Corporation, Chicago, Ill.
Filed Jul. 11, 1983, Ser. No. 512,749
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—11 **20 Claims**



14. A method for unloading lading from a wheeled tank car, said lading being of a type which is melted by heating for effective unloading and which produces noxious gases when heated, and said tank car having a storage tank for containing said lading, discharge port means on said storage tank through which said lading is emptied from said storage tank, and heating soil means on said storage tank for passing a heating fluid therethrough to melt said lading to facilitate emptying, comprising the steps of:
providing a vapor line means in fluid communication with said storage tank and a relatively remote recovery sink,
passing heating fluid through said heating coil means to melt said lading,
opening said vapor line means to said storage tank during the melting of said lading such that noxious gases produced during said melting are vented from said storage tank to said recovery sink, and
closing said vapor line means to said storage tank during the emptying of said lading from said storage tank.

4,515,190
ICE CREAM CAN FILLING MACHINE WITH CONTENT VARIGATOR
Frank A. Tindall, 1150 East U Ave., Vicksburg, Mich. 49097
Filed May 19, 1983, Ser. No. 496,136
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—131 **17 Claims**

1. In combination with a contineously operating source of fluid ice cream,
a downwardly enlarged and opening delivery cone connected at its upper end to the lower end of said source,
means for successively delivering empty cans on their sides with the open ends of the cans facing the lower end of the cone,
first pusher means arranged to push each can endwise against the side of said cone,
a vertically movable platform disposed in its uppermost position to receive bottom of the can under said cone,
support means for said platform guiding its movement to a lower position with the can thereon flush with the bottom of said cone,



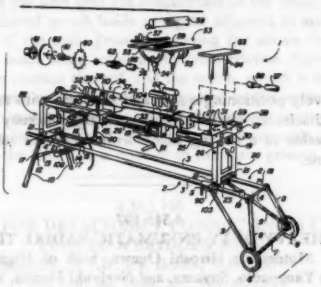
adjustable spring means biasing said support means to its upper position,
second pusher means arranged to push filled cans off of said platform,
fluid pressure operated means connected to simultaneously advance and retract said first and second pusher means,
a first control element actuated by movement of said platform to lowered position and connected to activate said pressure operated means to advance said pusher means,
and a second control means positioned to be actuated by movement of said pusher means to the limit of their advancing motion and connected to reverse the pressure operated means.

4,515,191
RADIAL UNIVERSAL TOOL
James R. Fetty, Chatham, La. 71226
Filed Aug. 22, 1983, Ser. No. 525,110
Int. Cl.³ B27C *9/00*
U.S. Cl. 144—1 C **20 Claims**

10. A radial universal tool comprising:
(a) a frame characterized by a pair of generally horizontally disposed supports joined at each end by cross supports and vertical struts supporting said supports at each end of said frame;
(b) a pivoting end member pivotally attached to one end of said supports and normally oriented in substantially vertical relationship with respect to said supports;
(c) a fixed end member releasably attached to the opposite end of said supports in spaced relationship with respect to said pivoting end member and normally oriented in substantially vertical relationship with respect to said supports;
(d) a top way fixedly disposed in said pivoting end member

and said fixed end member in substantially parallel relationship with respect to said supports and aligned in a first horizontal plane; a middle way fixedly disposed in said pivoting end member and said fixed end member in substantially parallel relationship with respect to said supports and said top way and aligned in a second horizontal plane; and a bottom way fixedly disposed in said pivoting end member and said fixed end member in substantially parallel relationship with respect to said supports and said top and said middle way and aligned in a third horizontal plane;

(e) feed screw means journalled for rotation in said pivoting end member and said fixed end member and screw drive



means attached to each end of said feed screw means for manipulating said feed screw means;

(f) radial tail stock means pivotally carried by said top way and disposed in pivotal cooperation with respect to said pivoting end member; and

(g) radial head stock means slidably carried by said top way, said middle way and said bottom way and in threadible cooperation with said feed screw means and a spindle rotatably mounted in said radial head stock means, whereby said radial head stock means can be slidably adjusted on said top way, said middle way and said bottom way, responsive to manipulation of said screw drive means on said feed screw means.

4,515,192

DEVICE FOR PROCESSING TREES OR THE LIKE

Jan Eriksson, Pl 345, S-810 20 Österfärnebo, Sweden

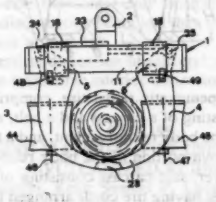
PCT No. PCT/SE82/00322, § 371 Date May 25, 1983, § 102(e) Date May 25, 1983, PCT Pub. No. WO83/01248, PCT Pub. Date Apr. 14, 1983

PCT Filed Oct. 7, 1982, Ser. No. 503,136

Claims priority, application Sweden, Oct. 7, 1981, 8105907

Int. Cl.³ B27L *1/00*

U.S. Cl. 144—2 Z **29 Claims**



1. In a trunk processing device of the type including at least two grabbing members, means mounting at least one of said grabbing members for pivoting movement in a pivoting plane relative to the other of said grabbing members, a plurality of rolls each having an axis, said rolls being relatively movable about their axes with respect to said grabbing members for effecting feeding movement of trunks at an angle to the pivoting plane, the improvement comprising means for adjustably positioning said grabbing members at any one of a plurality of different distances from each other in the absence of essentially any change in the mutual angular relationship of said roll axes relative to each other.

4,515,193

CUTTING TOOL AND HOLDER

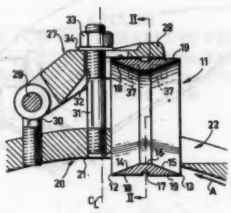
Karl-Erik A. Jonsson, Floraplan 14, S-802 28 Gävle, Sweden

Filed Feb. 8, 1983, Ser. No. 464,848

Claims priority, application Sweden, Feb. 12, 1982, 8200869

Int. Cl.³ B27C *1/14*

U.S. Cl. 144—172 **14 Claims**



13. In combination, a cylindrical cutting tool and a holder therefor, said tool having a cutting edge in each of its ends and at least one closed annular groove on its periphery located symmetrically between said edges, and said holder including a part-cylindrical recess in a surface of a tool carrier and clamping means connected to the tool carrier including a part-cylindrical surface, said part-cylindrical recess and said part-cylindrical surface having a radius corresponding to the radius of said cylindrical cutting tool, said cylindrical recess including part-annular ridge means adapted to engage said groove means such that axial displacement of said tool is prevented when said tool is received in said part-annular recess and clamped between it and said part-cylindrical surface.

4,515,194

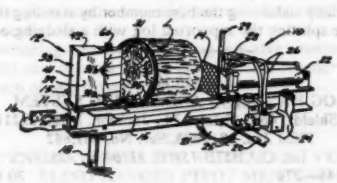
LOG SPLITTER HAVING SERVICEABLE WEDGE ASSEMBLY

Douglas D. Dankel, Kankakee, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Jun. 20, 1983, Ser. No. 506,035

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **28 Claims**



1. A log splitting apparatus comprising an elongated frame, selectively actuateable ram means mounted for longitudinal movement on one end of said frame, a wedge assembly mounted on the opposite end of said frame, said wedge assembly including a plurality of wedge tip sections each having a log splitting leading edge on a longitudinal axis thereof and being removably mounted in vertically stacked relation, said wedge tip sections each having interlocking means between mating upper and lower surfaces thereof for maintaining the

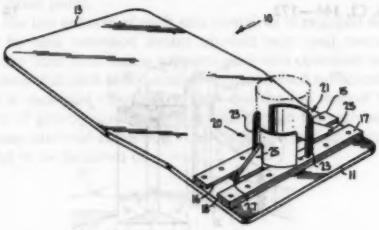
leading edges of said wedge tip sections in alignment, and means for supporting and retaining said stack of wedge tip sections on said frame with the longitudinal axes thereof parallel to the movement of said ram means.

4,515,195

METHOD AND APPARATUS FOR SUPPORTING LOGS AND THE LIKE

Harvey Gladstein, 309 E. 49th St., New York, N.Y. 10017

Filed Jul. 20, 1983, Ser. No. 515,508
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—366 **20 Claims**



1. Apparatus for supporting a log in upright position to permit the log to be longitudinally split, said apparatus comprising:

a base member having a top surface which is substantially horizontal in use;

a pair of support members; and

mounting means mounting said support members on said top surface of said base member for relative movement of said support members in one horizontal dimension toward and away from one another to permit a log to be engaged between said support members, said mounting means including further means for preventing inadvertent relative movement between said support members when a log is supported therebetween;

wherein said base member is sufficiently long in a second horizontal dimension perpendicular to the relative movement of said support members to permit a user of said apparatus to stand on said top surface and positionally stabilize said base member with the user's weight while sledging a log supported on end between said support members.

18. The method of supporting a log or piece of cord wood to be split comprising the steps of:

supporting the log upright on a base member between two supports which are mutually re-positionable toward and away from one another; and

positionally stabilizing the base member by standing thereon while splitting the supported log with a sledging action.

4,515,196

LOG HANDLING AND SAWING SYSTEM

Dean W. Shields, 4645 Calnita Pl., Jackson, Miss. 39211

Filed Jan. 28, 1983, Ser. No. 461,852
Int. Cl.³ B27B *15/00, 31/04, 31/06*
U.S. Cl. 144—378 **30 Claims**

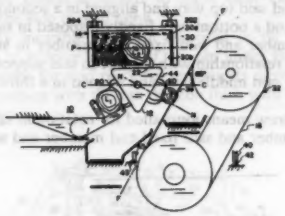
16. The method of positioning a log with respect to a saw comprising:

clamping a log while positioned in a first position in space;

rotating the clamped log about an axis of rotation generally parallel with, but spaced from, the log through a second position in space;

scanning a profile of said log while in said second position, scanning being with respect to a radial scale and distance from said axis of rotation, and therefrom the spatial position of a selected, generally longitudinal plane, located, said selected plane extending through the log, and being perpendicular to a radial plane along and through said axis of rotation;

further rotating said log about said axis of rotation to a third position in space; and



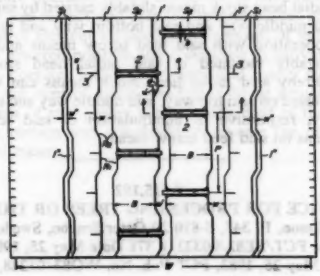
relatively positioning a saw and said log, with reference to said selected plane through said log, whereby said log is sawable in a sawing plane with regard to said selected plane.

4,515,197

HEAVY DUTY PNEUMATIC RADIAL TIRE

Kenichi Motomura; Hiroshi Ogawa, both of Higashiyamato; Akira Yamamoto, Sayama, and Noriyuki Hagita, Kuroiso, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 4, 1983, Ser. No. 491,488
Claims priority, application Japan, May 12, 1982, 57-78123
Int. Cl.³ B60C *11/06, 11/12*
U.S. Cl. 152—209 R **13 Claims**



1. A heavy duty penumatic radial tire, comprising; a body reinforcement consisting of a carcass and a belt, an outer rubber layer covering the body reinforcement, and a tread formed by covering the crown portion of the body reinforcement by the outer rubber layer; said carcass consisting of at least one rubberized cord layer having tire cords arranged therein in the substantial radial plane of the tire; said belt consisting of at least two metal cord layers arranged on the outer side of the carcass such that the metal cords in the adjacent cord layers are crossed with each other at a relatively small inclined angle with respect to the equatorial line of the tire; said tread having at least four lands formed thereon and separated from each

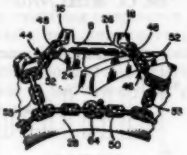
other by at least three main grooves extending continuously in zigzag form along the circumferential direction of the tread, each groove having a width of 3–10% based on the width of the tread; and said at least four lands having a pair of first group lands which are formed at the outermost sides of the tread and are substantially continuous along the circumferential direction of the tire; notches arranged at least at the edge portions of the lands which edge portions are other than those adjacent to the main grooves defining the above described first group lands, and being opened to the main grooves in an opening width of 0.5–4% in each notch based on the width of the tread such that the land near the center portion of the tread has a shear resistance in circumferential and axial directions less than that of the land near the side portion of the tread, each of a pair of second group lands arranged adjacent to and at the inner side of the main grooves defining the above described first group lands being softer at the inner portion thereof than at the outer portion thereof, and the notch, which is arranged on the second group land and is opened to the main groove adjacent to and at the inner side of the second group land, is increased in its depth from the center portion towards the edge portion of the land and is opened to the main groove.

4,515,198

MEANS FOR DETACHABLY CONNECTING A CHAIN LINK TO A SKIDDER RING

Emilien Labonville, R.F.D. #1, Berlin, N.H. 03570

Filed Apr. 30, 1984, Ser. No. 605,148
Int. Cl.³ B60C *27/20, 27/06*
U.S. Cl. 152—223 **6 Claims**



1. A skidder ring having means at four spaced locations for connection with the end links of tag chains,
each said means comprising a hook integral with said ring and extending away from said ring generally in the plane of said ring,
each said hook having a base portion attached to the ring, an intermediate section and an end portion,
said end portion being spaced from said ring a distance greater than the thickness of the link to be connected thereto,
the vertical cross sectional shape of said end portion being such as to permit the passage of said link thereover only when said link is held in substantially vertical position,
the transverse horizontal and vertical dimensions of said intermediate section being less than the transverse interior dimension of said link,
and the vertical dimension of said end portion being greater than the transverse interior dimension of said link.

4,515,199

COATING MATERIAL FOR USE ON SULFUR VULCANIZED RUBBER

Michael Kaniecki, Kent; Samuel P. Landers, Uniontown, and Thomas J. Botzman, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 13, 1984, Ser. No. 620,346
Int. Cl.³ B60C *5/00, 11/00, 13/00, 15/00*
U.S. Cl. 152—353 R **8 Claims**

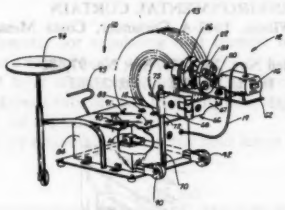
1. A method of manufacturing an article having indicia or an ornamental design thereon comprising the steps of:
(a) providing an article comprising at least an outer layer of pre-vulcanized rubber containing free sulfur therein;
(b) applying a coating between 0.001 and 0.010 inches thick of a liquid coating material to a surface of said pre-vulcanized rubber, said liquid coating material comprising a rubber cement that contains unvulcanized diene rubber, the total weight of said rubber being not greater than 10% of the weight of said liquid coating material; 0.1 to 10 phr of a sulfur rubber vulcanization accelerator; and 1 to 500 phr of particulate metallic particles that can pass through a number 325 mesh U.S. Standard Sieve, said liquid coating material being substantially free of carbon black and free sulfur; and
(c) allowing the rubber contained in said coating material to be auto-vulcanized.

4,515,200

APPARATUS FOR WHITEWALLING VEHICLE TIRES

Roy L. Williams, 6212 Nora St., Metairie, La. 70003

Filed May 24, 1983, Ser. No. 497,648
Int. Cl.³ B29H *21/08*
U.S. Cl. 157—13 **4 Claims**



1. An apparatus for grooving the wall portions of vehicle tires, which comprises:
a. a movable frame:
b. tire rotating means mounted on said frame for rotating the vehicle tire in contact with said means;
c. a buffing assembly mounted on said frame and swivelly positioned against at least one of said walls of said tire for removing material in an annular groove around one wall of said tire upon rotation of said tire; said buffing assembly means, including:
i. a central shaft member;
ii. a plurality of buffing blades, each of said blades rotatable about an indepedent axis;
iii. means for selectively interconnecting at least one of said buffing blades in driving engagement with said shaft member so that rotation of said shaft member imparts rotation to said interconnected buffing blade; and
d. switching means for imparting selective rotation speed to said tire rotating means and selective rotation speed to each of said driven buffing blades.

4,515,201

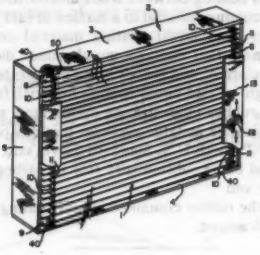
SUSPENSION MEANS FOR SUSPENDING VENETIAN BLIND HANGER PIVOT MEMBERS

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Division of Ser. No. 387,035, Jun. 10, 1982, Pat. No. 4,458,740, which is a continuation-in-part of Ser. No. 332,809, Dec. 21, 1981, abandoned. This application May 17, 1984, Ser. No. 611,207
Int. Cl.³ E06B *9/38*
U.S. Cl. 160—174 **2 Claims**

1. A combination of a venetian blind hanger pivot member connected to an end slat of an assemblage of venetian blind slats where the hanger pivot member includes a pivot bearing

portion having a pivot axis and a suspension means in the form of a wire bracket having an arm including an inturned end



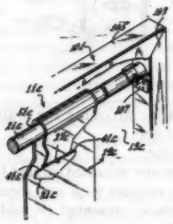
engaging in the bearing portion and a base extending perpendicularly to said arm adapted to be affixed to a part of a frame opening.

4,515,202

ENVIRONMENTAL CURTAIN

Bradford W. Wilson, 1642-A Coriander, Costa Mesa, Calif. 92626

Filed Nov. 26, 1979, Ser. No. 97,483
Int. Cl.³ A47H *13/00, 23/05*
U.S. Cl. 160—332 **2 Claims**



1. A strip curtain attachable to supporting structure having an open region at least partially closable by the strip curtain, said strip curtain comprising:

a plurality of elongated flexible strips;

an elongated curtain support;

means for attaching the curtain support to the supporting structure adjacent the open region;

each of said strips having an upper end portion terminating in an upper end;

at least a portion of each of said upper end portions being formed into a loop, each of said loops receiving the curtain support whereby the flexible strips can be suspended from the curtain support in side-by-side relationship;

at least one of said upper end portions being on a first of said strips and including releasable means responsive to a pulling force of at least about a predetermined magnitude on the first strip for allowing at least the portion of said first strip below said upper end portion thereof to fall from the curtain support;

said predetermined force being less than the pulling force on said first strip which is required to pull the curtain support down from the attaching means;

said attaching means attaching the curtain support to the supporting structure with the curtain support being spaced over a major portion of its length from the supporting structure and said releasable means being responsive to a pulling force of about at least said predetermined magnitude on the first strip for opening the loop of said first strip whereby said first strip can fall from the curtain support; and

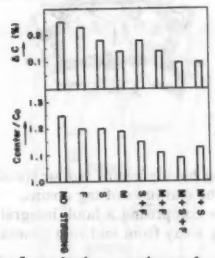
an opening in said end portion of said first strip with the opening being spaced from said end of said first strip by a segment of said first strip and a head and a neck on said segment of said first strip, said neck being of less width than the head and being between the head and said opening of said first strip, said head being insertable through said opening of said strip to place the neck in said opening of said first strip to form at least a portion of said segment into the loop for said first strip, said head being wider than said opening of said first strip whereby the head must be distorted to insert the head through the opening of said first strip, and said releasable means including said head being withdrawable through said opening in response to a pulling force on said first strip of about said predetermined magnitude.

4,515,203

CONTINUOUS STEEL CASTING PROCESS

Kiichi Narita, Kobe; Takasuke Mori, Ashiya, and Kenzo Ayata, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 250,041, Apr. 1, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 561,149
Claims priority, application Japan, Apr. 2, 1980, 55-43339; Apr. 2, 1980, 55-43340; Apr. 2, 1980, 55-43341
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—468 **15 Claims**



1. A method of producing continuously cast steel strands which have outer surfaces and which are greater than 200 mm×200 mm in cross-section by a continuous casting process in which molten steel is fed into a casting mold having an inner wall surface through a submerged nozzle and continuously drawn out downwardly of the casting mold, said method comprising the steps of:

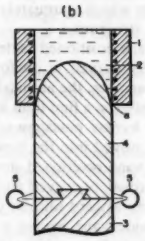
(a) electromagnetically stirring the molten steel at a position within said casting mold by application of a magnetic field induced by an alternating current of a frequency f=1.5 to 10 Hz and having a magnetic flux density G at the inner wall surface of said casting mold in the range of $195\times e^{-0.18f}$ to $1{,}790\times e^{-0.2f}$ gauss and also

(b) electromagnetically stirring the molten steel at a position in the final solidifying zone of each of said continuously cast strands by application of a magnetic field induced by an alternating current of a frequency f=1.5 to 10 Hz and having a magnetic flux density G at the outer surface of each of said continuously cast strands in the range of $895\times e^{-0.2f}$ to $2{,}137\times e^{-0.2f}$ gauss, said final solidifying zone being defined as the zone where the molten steel in each of said continuously cast strands is present as a molten steel pool having a generally circular or ovular cross-sectional shape and where the shorter diameter of the molten steel pool is less than 100 mm in length.

4,515,204
CONTINUOUS METAL CASTING

Atsumi Ohno, Chofu, Japan, assignor to Nippon Light Metal Company Limited and O.C.C. Company Limited, both of Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,650
Int. Cl.³ B22D 11/10, 27/04
U.S. Cl. 164—483 12 Claims



1. A continuous metal casting process comprising:
supplying a molten metal into a mold provided with an inlet and an outlet opening in such a manner that the pressure of said molten metal is maintained in the range of 0 to 0.005 kg/cm² at said outlet opening, while said mold has an inner wall maintained at a temperature sufficiently higher than the solidifying temperature of said metal so that the contiguous surface of the metal remains liquid while within the mold;
bringing a dummy bar having a temperature maintained lower than said solidifying temperature into contact with said molten metal at said outlet opening; and
moving said dummy bar away from said outlet opening, whereby a solidified body of said metal is formed continuously on the end of said dummy bar as the metal body leaves the wall opening.

4,515,205
METHOD FOR FLUIDIZED PARTICLE TRAY HEAT EXCHANGE

Masayoshi Kuwata, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

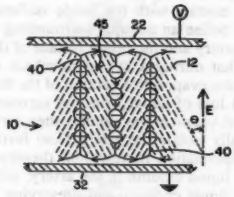
Division of Ser. No. 314,817, Oct. 26, 1981, Pat. No. 4,442,888.
This application Dec. 12, 1983, Ser. No. 560,651
Int. Cl.³ F28C 3/16
U.S. Cl. 165—1 6 Claims

1. A method of extracting heat from a heat-laden gas stream comprising the steps of:
(a) providing a fluidization tray unit wherein each unit includes at least two elongated fluidization trays being imperforate and having upturned sides, each tray containing a shallow bed of particulate matter having substantially no resistance to gas flow and each tray being laterally disposed and spaced from one another such that the shallow bed of particulate matter contained therein is not transferred therebetween;
(b) providing means for extracting heat wherein said heat extraction means is spaced from said elongated fluidization trays;
(c) passing the heat-laden gas stream through the fluidization tray unit in order to fluidize each elongated tray of particulate matter such that the fluidized particulate matter is brought in heat flow communication with said heat extraction means only when said particulate matter is fluidized; and
(d) extracting heat from the fluidized bed of particulate matter via said heat extraction means.

4,515,206
ACTIVE REGULATION OF HEAT TRANSFER

Edward F. Carr, Orono, Me., assignor to Board of Trustees of the University of Maine, Bangor, Me.

Filed Jan. 24, 1984, Ser. No. 573,140
Int. Cl.³ F28F 13/16
U.S. Cl. 165—1 24 Claims

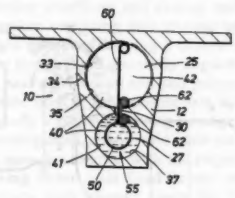


1. Apparatus for regulating heat transfer between a first body and a second body comprising:
a fluid layer of mesomorphic phase liquid crystal material interposed between and thermally coupling the first body and the second body; and
means for establishing an electric field across the fluid layer.

4,515,207
MONOGROOVE HEAT PIPE DESIGN: INSULATED LIQUID CHANNEL WITH BRIDGING WICK

Joseph P. Alario, Hauppauge; Richard F. Brown, East Meadow, and Robert L. Kosson, Massapequa, all of N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 30, 1984, Ser. No. 615,505
Int. Cl.³ F28D 15/00
U.S. Cl. 165—1 18 Claims



10. In a method for preserving the continuity of the fluid flow within the liquid channel to the evaporation section of a heat pipe, the heat pipe having an elongated, sealed envelope, the envelope having a condensing section for operation at a relatively low temperature, an evaporation section for operation at a relatively high temperature, separate vapor and liquid channels extending between the condensing and evaporation sections, the vapor and liquid channels being in a substantially longitudinally parallel side-by-side relationship at least in the evaporation and condensing sections, wall capillary means on the inside surface of the vapor channel in at least the condensing and evaporation sections, slot capillary means extending longitudinally within the envelope at least in the evaporation and condensing sections thereof for providing fluid communication between the vapor and liquid channels, a vaporizable

working fluid in the envelope, the fluid having a liquid phase and a vapor phase at the operating temperature of the heat pipe for evaporating in the high-temperature evaporation section and condensing in the low-temperature condensing section to transfer heat from the evaporation to the condensing section by phase change of the fluid, the liquid phase substantially filling the liquid channel at the operating temperature and flowing from the condensing section to the evaporation section, and the vapor phase flowing substantially independently along the vapor channel from the evaporation section to the condensing section, the improvement comprising:

(a) retaining a continuous liquid column of the working fluid within an artery located within at least the evaporation section of the liquid channel,

(b) supporting the artery spaced from and substantially free of thermal contact with the inside surface of the liquid channel to define an annulus surrounding the artery between the artery and the inside surface of the liquid channel, such that during a period in which excessive heat transfer to the evaporation section of the heat pipe causes boiling and loss of liquid from the surrounding annulus, the resultant vapor in the annulus then serves to insulate and thermally isolate the artery from further liquid loss through vaporization therewithin, thereby retaining the continuous liquid column in the artery, and hence in the core of the liquid channel, and preserving the continuity of the fluid flow within the liquid channel to the evaporation section, and

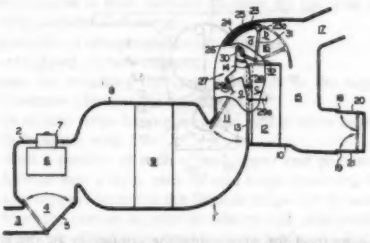
(c) feeding liquid from the artery to the wall capillary means on the inside surface of the vapor channel in the evaporation section, during such an excessive heat transfer period, through an auxiliary liquid flow path from the artery to the slot capillary means in the evaporation section of the envelope.

4,515,208

AIR CONDITIONING SYSTEM

Yukio Sakurai, Atsugi, and Akihiko Yamamoto, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 28, 1982, Ser. No. 343,471
Claims priority, application Japan, Feb. 12, 1981, 56-19329
Int. Cl.³ F28F *27/02*; B60H *3/00*; B61D *27/00*
U.S. Cl. 165—43 **3 Claims**



1. An air conditioning system comprising in combination:

a duct structure having at least one air inlet end and at least one air outlet end;

a refrigerant evaporator unit positioned downstream of the air inlet end thereof;

an air heater unit positioned downstream of the evaporator unit;

the duct structure having a wall portion formed with an air entrance chamber between said evaporator unit and said air heater unit and wall portion formed with an air distribution chamber between the air heater unit and said air outlet end of the duct structure;

an air-flow proportioning door positioned between said air entrance chamber and said air heater unit and angularly movable about an axis fixed in said duct structure between a first angular position fully shutting off a flow of air from the air entrance chamber to the air heater unit and a second angular position allowing the air heater unit to be fully open to the air entrance chamber;

the duct structure further having a wall portion formed with a bypass passageway leading from the air entrance chamber to the air distribution chamber and bypassing said air heater unit;

a vane guide member secured to said duct structure and formed with a slot which is arcuately curved about an axis fixed in the duct structure,

an air-flow guide vane positioned aside said bypass passageway and arcuately curved in conformity to said slot of said vane guide member, the arcuately curved guide vane being movable between a first limit angular position withdrawn from the bypass passageway and a second limit angular position moved into the bypass passageway;

a stationary guide vane positioned downstream of said air heater unit and arcuately curved and extending from said bypass passageway toward said air distribution chamber, the stationary guide vane having a corresponding edge thereof with said air-flow guide vane when the air-flow guide vane is held into abutment with said stationary guide vane, and

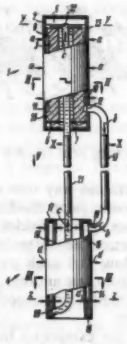
vane drive means intervening between said air-flow proportioning door and said air-flow guide vane and operative to translate the movement of the air-flow proportioning door between the first and second angular positions thereof into the movement of the first and second limit angular positions, respectively, of the guide vane, said vane drive means comprising a control lever angularly movable with said air-flow proportioning door about said axis, and a bell-crank lever angularly movable about an axis fixed in said duct structure and substantially parallel with the axis about which the air-flow proportioning door is angularly movable, the bell-crank lever being pivotally connected to said control lever and to said air-flow guide vane.

4,515,209

HEAT TRANSFER APPARATUS

Jury F. Maidanik; Sergei V. Vershinin, both of Sverdlovsk; Valery F. Kholodov, Zhukovsky, and Jury E. Dolgirev, Sverdlovsk, all of U.S.S.R., assignors to Otdel Fiziko-Tekhnicheskikh Problem Energetiki Uralskogo Nauchnogo Tsentra Akademi Nauk SSR, U.S.S.R.

Filed Apr. 3, 1984, Ser. No. 596,444
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—104.22 **11 Claims**



1. A heat transfer apparatus comprising:

an evaporating chamber;

a side wall of said evaporating chamber;

two end face walls of said evaporating chamber;

a vaporizer of capillary material permeable to a heat transfer fluid and arranged coaxially inside said evaporating chamber to maintain a thermal contact with a heat source;

a first end cavity defined by one end surface of said vaporizer, said side wall and one of the two said end face walls of said evaporating chamber;

a second end cavity defined by another end surface of said vaporizer, said side wall and the other of the two said end face walls of said evaporating chamber;

a longitudinal axial passage arranged in said vaporizer and communicable with said first end cavity and said second end cavity;

smooth annular projection provided on the outer surface of said vaporizer adjacent ends thereof to prevent the heat transfer fluid in a vapor phase from flowing into said first and second end cavities;

a vapor header to collect the heat transfer fluid in a vapor phase arranged on the outer surface of said vaporizer;

vapor release passages provided on the outer surface of said vaporizer interposed between said smooth annular projections defined by longitudinal recesses and a plurality of annular recesses intersecting with the longitudinal recesses, said vapor release passages being communicable with said vapor header;

a condenser chamber;

a first shell defining an outer wall of said condenser chamber;

a second shell defining an inner wall of said condenser chamber, said second shell being secured inside said first shell coaxially therewith to form between the wall of said first shell and the wall of said second shell a space isolated from the outside, the cross-section of said space reducing in the direction of vapor travel path therealong;

a first pipe connecting said vapor header to a zone of said condenser chamber containing the heat transfer fluid in a vapor phase;

a second pipe connecting said evaporating chamber to a zone of said condenser chamber containing the heat transfer fluid in a liquid phase and passing inside said longitudinal axial passage;

an inlet port of said second pipe communicable with said space in an area thereof having the least cross-section;

an outlet port of said second pipe disposed inside said first end cavity of said evaporating chamber furtherst from said condenser chamber.

4,515,210

HEAT EXCHANGER HAVING A PLASTICS MEMBRANE

John Smith, Cardiff, and David A. Boiston, Nuneaton, both of England, assignors to Courtaulds PLC, London, England

PCT No. PCT/GB82/00006, § 371 Date Aug. 12, 1982, § 102(e) Date Aug. 12, 1982, PCT Pub. No. WO82/02427, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 14, 1982, Ser. No. 414,340

Claims priority, application United Kingdom, Jan. 15, 1981, 8101262; European Pat. Off., Jan. 13, 1982, 82300170.6

Int. Cl.³ F23F *13/02*

U.S. Cl. 165—133 **6 Claims**

1. In a heat exchanger having means for separately introducing and withdrawing two fluids between which heat is to be transferred, said fluids being separated in said exchanger by heat exchange membrane through which heat is transferred from one fluid to the other, the improvement which comprises employing as said membrane a polyolefin or polyester film, at least one surface of which has been given greater wettability by having been treated with an oxidizing agent selected from the group consisting of sulphur trixoide, ozone, oleum, chlorosulphonic acid and chromosulphuric acid, whereby the fluid in contact with said treated surface of said film flows over said surface as a liquid film.

4,515,211

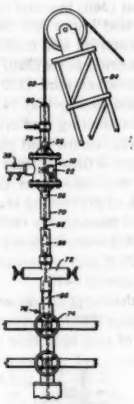
TOOL CABLE FEEDING SYSTEM

Michael R. Reed, and Daniel E. Hoffman, both of Bakersfield, Calif., assignors to Petro Tool, Inc., Bakersfield, Calif.

Filed Nov. 25, 1983, Ser. No. 555,143

Int. Cl.³ E21B *19/08*

U.S. Cl. 166—77 **3 Claims**



1. In a cable feeding system for a well, a cable feed device, said feed device including a cable drive wheel, a gripping roller mounted for selective movement toward and away from said drive wheel for the engagement of a cable against said drive wheel, a hydraulic motor in direct driving engagement with said drive wheel, a hydraulic cylinder unit engaged with said gripping roller for a selective positioning thereof relative to said drive wheel, a remote source of pressurized hydraulic fluid, hydraulic lines communicating said source with said motor and said cylinder unit, and control means controlling flow of pressurized fluid through said hydraulic lines, said control means being located remote from said hydraulic motor and said hydraulic cylinder unit, said cable feed device further including a vertical housing, said housing having a peripheral wall about a central axis and defining upper and lower ends, an upper plate member overlying and closing said upper end, a lower plate member overlying and closing said lower end, each of said plate members defining a central opening therethrough into the housing and generally aligned along the axis of said housing, said drive wheel and said gripping roller aligning to the opposite sides of the housing axis, upper and lower guides each having a cable receiving passage therethrough, said guides extending inward from said plate members with the cable receiving passages aligned with the respective openings, said guides having outer ends fixed to the respective plate members and inner ends aligned along the housing axis at points immediately above and below the drive wheel and gripping roller for the guided passage of a cable therebetween.

4,515,212

INTERNAL CASING WIPER FOR AN OIL FIELD WELL BORE HOLE

Michael E. Krugh, Casper, Wyo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 20, 1983, Ser. No. 459,566

Int. Cl.³ E21B *31/03, 31/06, 31/08*

U.S. Cl. 166—99 **3 Claims**

1. An improved internal casing wiper tool connected to a drill string (20) for wiping the casing sides (40) of a well bore hole (30) to remove debris (60) contained thereon, said bore hole (30) having fluid (50) with debris (60) contained therein, said tool being capable of collecting larger sized pieces (430) of debris in a first chamber (210) and collecting smaller sized

pieces (440) of debris in a second collection chamber (300) as said drill string (20) is lowered into said well bore hole, said improved tool comprising:

a crossover joint (330) having one end (340) connected to the lower end (350) of the drill string (20) and having a formed internal fluid passageway (410), said crossover joint comprising:

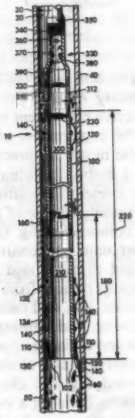
(a) a drill pipe float (360) inserted in said passageway (410) and contacting said lower end (350) for preventing said fluid (50) from entering said drill string (20), and

(b) a plurality of formed ports (380) around the mid-section (370) of said crossover joint (330) to allow fluid (50) to flow out from said passageway (410),

a check valve (320) contacting said crossover joint located in said passageway (410) below said plurality of formed ports (380) for permitting the flow of fluid upwardly through said passageway (410) into said ports (380), said check valve (320) being capable of preventing the flow of said fluid (50) downwardly in said passageway (410),

an elongated pipe (100) having its upper end (310) connected to the second end (390) of said crossover joint (330) for extending said fluid passageway (410),

a plurality of centralizers (130) disposed around the outer periphery of said pipe (100) for supporting said pipe substantially in the center of said bore hole (30),



a petal basket (110) connected to the lower end (102) of said pipe (100) having a plurality of outwardly extending petals (120) around its periphery, said petals (120) under pressure of said fluid (50) being capable of abutting and wiping said casing sides (30) to dislodge said debris (160),

a first filter (60) located a first predetermined distance (150) from said lower end (102) of said pipe (100) for collecting said larger pieces (430) of debris (60) in a first chamber (210) located in said pipe (100) between said first filter (160) and said petal basket (110), and

a second filter (230) located a second predetermined distance (220) from said lower end (102) of said pipe (100) for collecting said smaller pieces (440) of debris (60) in a second chamber (300) located in said pipe (100) between said first filter (160) and said second filter (230) so that as said tool is lowered in said well bore hole (30) said fluid (50) is entrained upwardly into said passageway (410) through said first filter (160), through said second filter (230), through said check valve (320) and out said ports (380) and back into said well bore hole (30), said larger pieces (430) of debris (60) in said fluid (50) being collected in said first chamber (210) and said smaller pieces (440) of debris (60) being collected in said second chamber (300).

4,515,213

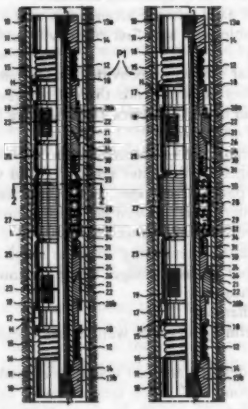
PACKING TOOL APPARATUS FOR SEALING WELL BORES

Neil E. Rogen, and Dewa N. Adnyana, both of Houston, Tex., assignors to Memory Metals, Inc., Stamford, Conn.

Filed Feb. 9, 1983, Ser. No. 464,787

Int. Cl.³ E21B *33/12*

U.S. Cl. 166—123 **23 Claims**



1. An improved packing tool for sealing spaces between the wall of a well bore, and

means defining an elongate member disposed longitudinally in the well bore comprising,

substantially cylindrical metal sealing means supportable peripherally about said elongate member and a plurality of helical spring elements extending between said elongate member and the inside surface of said sealing means

said sealing means and said helical spring elements containing a shape memory alloy material which maintains a radially contracted condition at below a predetermined temperature—corresponding to the transition temperature of said shape memory alloy—to enable introduction of said sealing means into said well bore and which responds to the temperature thereof rising above said transition temperature by transforming into a radially expanded condition to urge said sealing means to make sealing contact with the wall of said well bore.

4,515,214

METHOD FOR CONTROLLING THE VERTICAL GROWTH OF HYDRAULIC FRACTURES

John L. Fitch, Dallas, and Malcolm K. Strubhar, Irving, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,815

Int. Cl.³ E21B *47/00, 43/267*

U.S. Cl. 166—250 **18 Claims**

1. A method of fracturing a subterranean formation that is located adjacent another formation in which fracturing is to be inhibited, comprising the steps of:

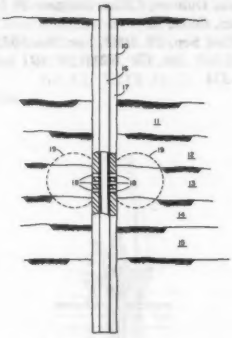
a. determining the fracturing gradient in the subterranean formation to be fractured,

b. determining the fracturing gradient in the adjacent formation wherein fracturing is to be inhibited,

c. determining from said fracturing gradients the fracturing fluid density necessary to inhibit the propagation of fracturing into said adjacent formation more than a specified vertical distance,

d. selecting a fracturing fluid with the necessary density for inhibiting the propagation of said fracturing into said

adjacent formation more than said specified vertical distance, and



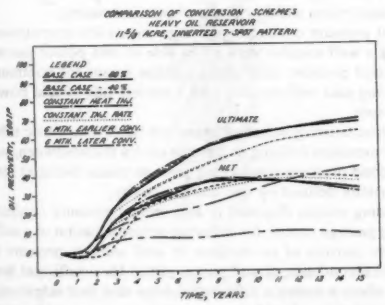
e. fracturing said subterranean formation with said fracturing fluid.

4,515,215

STEAM INJECTION METHOD WITH CONSTANT RATE OF HEAT

Chester E. Hermes, and Wann-Sheng Huang, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 21, 1984, Ser. No. 581,922
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—272 **8 Claims**



1. A method for recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises: p0 (a) injecting steam of a relatively high quality into the formation through an injection well;

(b) reducing the quality of the steam being injected to a quality of about 25% to about 50% at about the time of steam breakthrough at a production well;

(c) increasing the rate of steam injection simultaneously with reducing the quality of the steam to maintain a constant input of heat into the formation; and

(d) recovering hydrocarbons and other fluids at a production well.

4,515,216

METHOD OF USING THIXOTROPIC CEMENTS FOR COMBATING LOST CIRCULATION PROBLEMS

Jerry Childs; Fred Sabins, both of Duncan, and Mary J. Taylor, Sterling, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 11, 1983, Ser. No. 540,741
Int. Cl.³ E21B *33/138*
U.S. Cl. 166—293 **14 Claims**

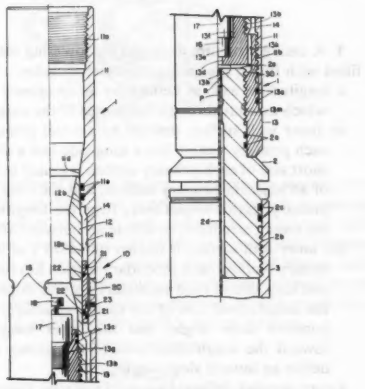
1. A method for combating lost circulation in a zone during cementing of oil, gas, and water wells comprising pumping a thixotropic cement slurry into said zone, terminating pumping, and allowing said static slurry to set, wherein said slurry comprises water, hydraulic cement, an effective amount of crosslinking agent selected from the group consisting of titanium chelates and an effective amount of crosslinkable agent selected from the group consisting of water-soluble cellulose ethers; polyvinyl alcohol; homopolymers, copolymers and terpolymers of AMPS (2-acrylamido - 2-methlypropane sulfonic acid), sodium vinylsulfonate, acrylamide, N,N dimethylacrylamide and acrylic acid; and mixtures thereof.

4,515,217

PERFORATING GUN PRESSURE ACTIVATED SLIDING SLEEVE

Gregg W. Stout, Montgomery, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Dec. 27, 1983, Ser. No. 565,361
Int. Cl.³ E21B *34/08, 43/116*
U.S. Cl. 166—297 **9 Claims**



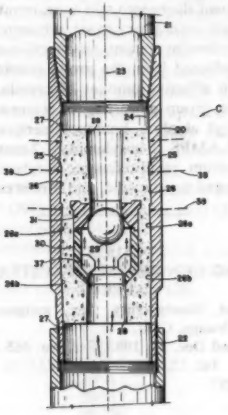
1. Apparatus for underbalanced perforating of a well casing and adjoining formation comprising: a tubing string communicable to a perforating gun housing disposed in a well casing, said tubing string including a ported housing above said perforating gun housing; said ported housing above said perforating gun housing; said ported housing having radially spaced walls defining an axially extending, annular fluid pressure chamber and at least one radial port traversing said walls; a sleeve sealably insertable in said annular fluid pressure chamber and axially movable between a closed position crossing at least a portion of said radial port and a non-overlapping open position relative to said radial port; means selectively securing said sleeve in said port closing position, whereby the fluid pressure in said perforating gun housing may be maintained below anticipated formation fluid pressure; and conduit means in said ported housing for applying casing annulus fluid pressure produced by firing the perforating gun to one axial end of said sleeve to shift same to said port opening position.

4,515,218

CASING STRUCTURES HAVING CORE MEMBERS UNDER RADIAL COMPRESSIVE FORCE

Harold S. Bissonnette, Broken Arrow, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 27, 1984, Ser. No. 584,194
Int. Cl.³ E21B *33/13*
U.S. Cl. 166—328 7 Claims



1. A casing structure designed for lowering into a borehole filled with fluids, the casing structure includes:

a longitudinal axis, as defined by an imaginary straight line which extends through the center of the casing structure;

an inner wall surface defined by several primary sections, each primary section has a long side and a short side, the short side of each primary section is joined to the long side of an adjacent primary section, and the long side of each primary section slopes away from the longitudinal axis of the casing structure, to define an outward slope angle;

the inner wall surface is further defined by at least one secondary section, each secondary section has two long sides, one long side of each secondary section slopes away from the longitudinal axis of the casing structure, to define an outward slope angle, and the other long side slopes toward the longitudinal axis of the casing structure, to define an inward slope angle;

a core member defined by a solid material, the core member has a lengthwise bore therein which defines a passage for fluids to pass through the casing structure, an upper face of the core member is defined at one end of the bore, and a lower face of the core member is defined at the opposite end of the bore, the outer surface of the core member is in continuous contact with the inner wall surface of the casing structure, to provide means for retaining the core member within the casing structure;

a closure member is positioned in the bore of the core member, and the closure member has open and closed positions for controlling the flow of fluids through the casing structure;

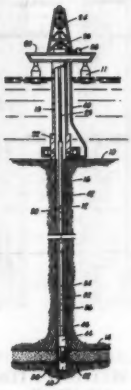
wherein, in operation, the casing structure is lowered into a borehole filled with fluids, the closure member moves to its closed position, the fluids exert a hydraulic force against the upper and lower faces of the core member, and the outward and inward slope angles of the inner wall surface of the casing structure cause the core member to be placed under a radial compressive force.

4,515,219

LOW PRESSURE RESPONSIVE DOWNHOLE TOOL WITH FLOATING SHOE RETARDING MEANS

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1983, Ser. No. 533,901
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—374 20 Claims



1. An annulus pressure responsive downhole tool apparatus, comprising:

a tool housing;

a power piston slidably disposed in said housing;

a first pressure conducting passage means for communicating a well annulus with a first side of said power piston;

a second pressure conducting passage means for communicating said well annulus with a second side of said power piston;

said tool housing including inner and outer concentric tubular members defining an annular cavity therebetween, said second pressure conducting passage means being at least partially defined by said annular cavity;

retarding means, disposed in said second pressure conducting passage means, for delaying communication of a sufficient portion of an increase in well annulus pressure to said second side of said power piston for a sufficient time to allow a pressure differential from said first side to said second side of said power piston to move said power piston from a first position to a second position relative to said housing, said retarding means including an annular floating shoe closely received in said annular cavity, said floating shoe including resilient friction means snugly engaging both said inner and outer tubular members of said tool housing; and

pressure relief means, communicated with a first portion of said second pressure conducting passage means between said second side of said piston and said retarding means, for relieving from said first portion of said second pressure conducting passage means a volume of fluid sufficient to permit said power piston to travel to its said second position.

4,515,220

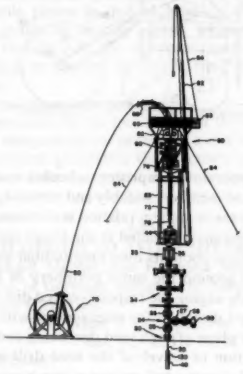
APPARATUS AND METHOD FOR ROTATING COIL TUBING IN A WELL

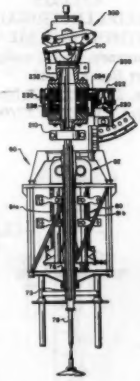
Phillip S. Sizer, Farmers Branch; Don C. Cox, Roanoke, and Malcolm N. Council, Richardson, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 12, 1983, Ser. No. 560,866

Int. Cl.³ E21B *19/22*

U.S. Cl. 166—384 **39 Claims**





1. Apparatus for injecting coil tubing into a well for performing a downhole operation which requires rotation thereof, comprising:

a. means for injecting coil tubing into a well;

b. quill means for surrounding said coil tubing and being movable longitudinally by said injecting means;

c. means for releasably gripping said coil tubing, said gripping means being rotatably supported by said quill means and movable therewith; and

d. means for rotating said gripping means relative to said quill means.

20. A method of servicing a well, comprising:

a. installing a length of coil tubing in the well through use of a coil tubing injector; and

b. rotating said length of coil tubing to perform a downhole operation in the well.

4,515,221

TRACTOR HAVING GUIDANCE SYSTEM

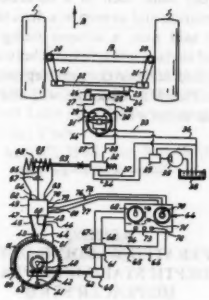
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

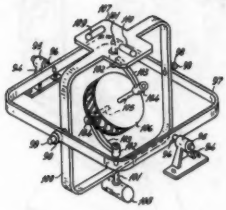
Continuation-in-part of Ser. No. 004,541, Jan. 18, 1979, abandoned. This application Sep. 24, 1981, Ser. No. 305,271

Claims priority, application Netherlands, Jan. 19, 1978, 7800648

Int. Cl.³ A01B *69/04*

U.S. Cl. 172—3 **19 Claims**





1. An agricultural tractor having an automatic steering device including at least one accelerometer which generates signals responsive to side-to-side motion of the tractor, said accelerometer carried by said tractor in a horizontal position transverse to the tractor's normal direction of travel, said accelerometer being stabilized in its horizontal position by at least one gyroscope, the axis of rotation of said gyroscope being virtually parallel to the earth's axis of rotation.

4,515,222

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Dec. 7, 1982, Ser. No. 447,613

Claims priority, application Netherlands, Dec. 8, 1981, 8105506

Int. Cl.³ A01B *29/04*

U.S. Cl. 172—68 **12 Claims**

13

1. A soil cultivating implement comprising a frame and a rotatable elongated roller mounted on said frame, said roller having an outer periphery defined by elongated outwardly directed projections, these projections being spaced apart from one another along the length of the roller and being positioned in side-by-side relationship, neighboring projections having inner parts with relatively facing inner side-surfaces which are substantially parallel to the implement's usual direction of

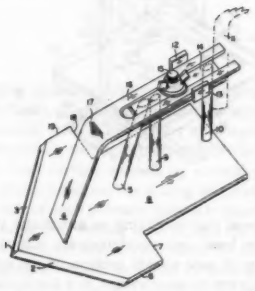
travel and which skeletally define planes diverging outwardly with respect to said roller's axis of rotation towards the outermost circumference of said roller, each of said neighboring projections further having outer ground-engaging parts extending outwardly from said inner parts, said inner parts being substantially in a plane radial with respect to the axis of rotation of the roller, said outer parts being bent over away from a plane radial to said axis, each said inner part converging as it extends outwardly both seen in a direction parallel to the roller's axis of rotation and as seen in a direction which is radial with respect to said axis, a scraper being mounted spaced above the ground surface and to extend between said neighboring projections, said scraper cooperating with said outwardly diverging side-surfaces to dislodge soil and debris from said roller during said roller's rotation.

4,515,223

HAND OPERATED WEEDING DEVICE WITH OPERATING DEPTH STABILIZER PLATE AND WEED DISPLACER STRIP

Wade A. Erickson, 120 E. 3rd St., Box 125, Yankton, S. Dak. 57078

Filed Aug. 22, 1983, Ser. No. 524,901
Int. Cl.³ A01B *1/16*
U.S. Cl. 172—372 **2 Claims**



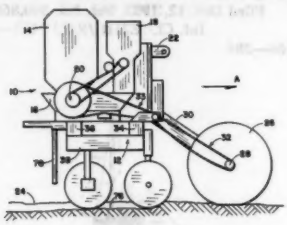
1. A hand operated weeding device comprising:
(a) flat stabilizer plate, said stabilizer plate including an upper surface, a forward cutting edge, and a rearward edge opposite to said cutting edge;
(b) a row of upright rods fixedly attached to the upper surface of said stabilizer plate, said row of rods extending from near said rearward edge forwardly toward but spaced from said cutting edge, the one of said rods nearest said cutting edge being slanted with the top thereof touching the one of said rods next nearest to said cutting edge;
(c) an elongated handle shank, said shank being fixedly attached to the rearmost one of said rods with an orientation such that the trailing portion of said shank extends upwardly and rearwardly from said stabilizer plate;
(d) a platform plate fixedly attached to the top of said rods;
(e) a weed displacer strip mounted on top of said platform plate and extending forwardly and downwardly therefrom so as to touch said upper surface of said stabilizer plate between said cutting edge and said rod nearest said cutting edge, said weed displacer strip adapted to shove weeds away which have been cut by said stabilizer plate as said stabilizer plate is shoved forwardly during the weeding process, said stabilizer plate acting as a self-stabilizer of its operating depth when it is operating in soil.

4,515,224

SEED DRILL WITH IMPROVED SEED DISC MEANS

Corliss H. Currie, Rte. 2, Box 154, Bennington, Okla. 74723

Filed May 2, 1983, Ser. No. 490,778
Int. Cl.³ A01C *5/06*; A01B *35/28*
U.S. Cl. 172—572 **6 Claims**



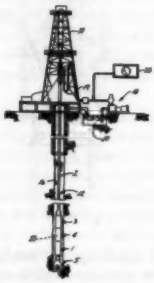
1. A seed drill apparatus comprising wheeled main frame means, at least two rod members slidably and rotatably secured to the main frame means in tandem relation with respect to one another, a seed disc means journalled at the lower end of each rod member for rotation about its own longitudinal axis, yieldable means disposed around the outer periphery of each rod member for constantly urging the respective seed disc independently in a downward direction for engagement with the surface of the earth, the plane of each seed disc being canted with respect to the direction of travel of the seed drill apparatus whereby a combined plowing and groove action is produced at the surface of the ground to provide at least one seed receiving groove during movement of the seed drill apparatus.

4,515,225

MUD ENERGIZED ELECTRICAL GENERATING METHOD AND MEANS

Patrick E. Dailey, Torrance, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jan. 29, 1982, Ser. No. 343,871
Int. Cl.³ E21B *47/00*
U.S. Cl. 175—40 **4 Claims**



1. A drilling instrument having electrical generating means for use in the passage of a conduit through which mud is forced to flow, the instrument comprising:
at least one passage for containing a fluid separate from the mud in the conduit passage;
means for forming a pressure pulse in the mud flowing in the passage of the conduit;
an upstream reservoir for containing the separate fluid and for positioning at an upstream position in the flow of mud from the means for forming a pressure pulse, the upstream reservoir being characterized in that it provides pressure from the adjacent mud to the separate fluid therein;

an accumulator for the separate fluid and comprising a movable piston biased in one direction in the accumulator;

the at least one passage comprising a passage portion coupled for receiving separate fluid from the upstream reservoir and the accumulator;

the separate fluid flowing from the upstream reservoir, responsive to the pressure pulse in the mud, into the accumulator for moving the piston against the bias, and along said passage portion, energy stored from the movement of the piston against the bias subsequently forcing the biased piston to move and force the separate fluid to flow out of the accumulator and along the passage portion;

the movable piston in the accumulator comprising a spring biased piston for storing energy when separate fluid is received therein from the upstream reservoir and for moving the piston to thereby move the fluid through the passage portion;

an electrical generator; and

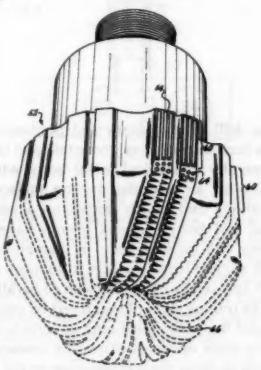
means responsive to the movement of the separate fluid in the at least one passage for providing a mechanical movement to the electrical generator, the electrical generator being responsive to the movement for generating electrical energy.

4,515,226

TOOTH DESIGN TO AVOID SHEARING STRESSES

Hans-Eckhard Mengel, and Hermann Munzel, both of Celle, Fed. Rep. of Germany, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Mar. 7, 1983, Ser. No. 473,021
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—57 **12 Claims**



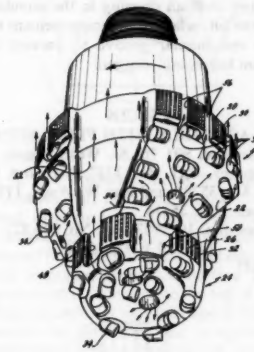
1. An improvement in a rotating bit including a plurality of teeth, wherein each tooth includes a synthetic geometrically shaped polycrystalline diamond cutting element, said improvement comprising a selected inclination of each tooth disposed on said bit, each tooth being subjected to an average vertical loading force and an average radial force, said radial force and vertical loading force vectorially adding to form a first resultant force on said tooth, wherein said selected inclination of said tooth is particularly characterized by orientation of said tooth so that said first resultant force as applied to said diamond cutting element included within said tooth is in a predetermined direction to minimize shearing stress by said resultant force on said diamond cutting element, wherein said diamond cutting element has a triangular prismatic shape including an apical edge extending from said bit to form the outermost cutting portion of said diamond cutting element and wherein said tooth is inclined on said bit so that said first resultant force lies approximately along the direction of the bisector of the angle of said apical edge of said diamond cutting element.

4,515,227

NOZZLE PLACEMENT IN A DIAMOND ROTATING BIT INCLUDING A PILOT BIT

Jerry Cerkovnik, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Apr. 27, 1983, Ser. No. 489,197
Int. Cl.³ E21B *10/60*
U.S. Cl. 175—65 **6 Claims**



2. An improvement in a rotating bit including at least one reamer lobe, and a pilot bit portion also defined in said bit characterized by a longitudinal axis, said pilot bit portion provided with drilling fluid from at least one orifice defined therein,

a jet nozzle defined in said bit to provide drilling fluid to said bit face, said jet nozzle particularly characterized by disposition on said lobe, said jet nozzle including an outlet orifice disposed on said lobe so that drilling fluid exiting said outlet orifice flows across said lobe, said lobe providing a substantially flush surface in the proximity around said orifice, said jet nozzle disposed at an upward acute angle with respect to said longitudinal axis;

means defining a fluid filled channel communicating with the proximity of said lobe wherein said nozzle is disposed, said channel in fluidic communication with fluid flow across said pilot bit portion, and wherein said nozzle is disposed in the proximity of said channel so that drilling fluid ejected by said nozzle entrains drilling fluid provided by said channel thereby tending to draw said drilling fluid from said channel into the flow of drilling fluid ejected from said nozzle.

4,515,228

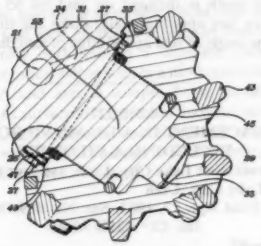
AIR GROOVE SCRAPER

George E. Dolezal, Friendswood, and Joseph L. Kelly, Jr., Houston, both of Tex., assignors to Hughes Tool Company - USA, Houston, Tex.

Filed Nov. 28, 1983, Ser. No. 555,735
Int. Cl.³ E21B *12/06*
U.S. Cl. 175—313 **4 Claims**

1. An improved earth boring bit having a body with a hol-

low interior, a leg with a depending shaft to support a bearing, a rotatable cutter on the bearing, an annular seal between the cutter and the shaft, an annular groove formed in a radial surface at the end of the cutter and shaft adjacent to, and



exterior of, the annular seal, with an air exit port, and a gas passage extending from an opening in the annular groove to the interior of the bit, wherein the improvement comprises:

a scraper in the annular groove to prevent the annular groove from becoming plugged.

4,515,229

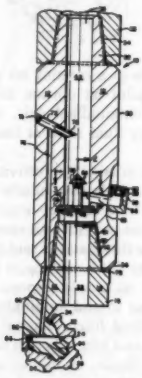
DRILL BIT ASSEMBLY WITH FLUID SEPARATOR

Donald D. Drummond, 801 7th St. West, Jasper, Ala. 35501; Walter F. Johnsey, P.O. Box 1237, 831 First Ave., North, Birmingham, Ala. 35201, and Roy W. Wood, 119 Persimmon St., Birmingham, Ala. 35214

Filed Jun. 10, 1983, Ser. No. 503,322

Int. Cl.³ E21B *10/60*

U.S. Cl. 175—337 **15 Claims**



1. A bit assembly for drilling into a hard material comprising:

an elongated housing having a drill end adapted for attachment to a rotary drill and a tool end for receiving a tool having at least one cutting cone for engaging and cutting a drill hole into material to be drilled;

a plenum chamber within the housing for receiving pressurized gaseous fluid of air and water from a fluid source;

pressure reducing means comprising a flow restricting orifice in the plenum chamber to provide a reduced pressure and reduced quantity of flow;

first conduit means communicating with said flow restricting orifice for receiving the reduced flow from the pressure reducing means and for directing the reduced flow from the plenum chamber out of the housing into the area of the cutting cone in the drill hole and into impingement upon the material being drilled to pick up and remove dust and cuttings from the vicinity of the cutting cones;

separator means supported within the plenum chamber on housing walls defining the plenum chamber in a position for separating water out of the flow of pressurized fluid prior to the pressurized fluid flow through the pressure reducing means; and

second conduit means comprising at least one passage through the wall of the housing downstream of the separator means and above the orifice and having a nozzle outlet positioned for discharging a flow of the pressurized fluid toward the drill end of the housing and away from the cutting cone, the flow of gaseous fluid to pass through the second conduit means picking up the water separated by the separator means for exhaust through the second conduit means;

the relative sizes of the flow restricting orifice and the nozzle outlet being such that the first fluid flow is sufficient in quantity and velocity for conveying the dust and cuttings removed from the vicinity of the cutting cone into the second flow of fluid, and the second fluid flow is of a high velocity from the nozzle outlet and a quantity sufficient to combine with the first flow for conveying the dust and cuttings out of the drill hole.

4,515,230

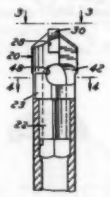
ROOF DRILL BIT

Thomas C. Means, Versaille, and Kenneth C. Emmerich, Lexington, both of Ky., assignors to Fansteel Inc., North Chicago, Ill.

Continuation of Ser. No. 436,582, Oct. 25, 1982, abandoned. This application Aug. 21, 1984, Ser. No. 642,886

Int. Cl.³ E21B *10/46*

U.S. Cl. 175—410 **1 Claim**

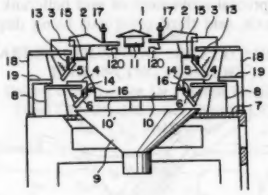


1. A mining drill bit for rotary and percussion drilling of hard materials such as rock, coal, concrete and the like which includes a generally cylindrical metal body with an axis of rotation and having an acircular driving surface axially disposed on a driving end of the body and a central cooling passage within said body, support prongs extending axially from a working end on said body in diametrically opposed quadrants with aligned ledge surfaces to support the bottom of a cutting insert and axially extending spaced parallel surfaces in contact with the trailing sides of said insert on opposite sides of the center of said body, the remaining quadrants being formed to provide chip slash openings extending toward the driving end of said body to form ports connecting to the central cooling passage of the body, that improvement in which said support prongs have flat axially extending surfaces substantially at right angles to each other extending axially from the working end of the body to form side edges of a wall port opening between the working end and the driving end into the central cooling passage, one of said support prongs on the trailing side of each said port being cut away radially to form an arcuate, semicircular entrance at one side of a wall port underlying the respective outer ends of the cutting insert to substantially increase the circumferential extent of said wall ports to 180°.

4,515,231
COMBINATORIAL WEIGHING APPARATUS WITH SERIAL WEIGHING OPERATIONS

Takehisa Ishida, Uji, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jan. 21, 1983, Ser. No. 459,944
Int. Cl.³ G01G *19/22, 19/32, 15/00*
U.S. Cl. 177—25 12 Claims



1. A combinatorial weighing apparatus for weighing articles comprising:

a supply device for supplying articles;

a plurality of pool hoppers positioned adjacent to said supply device for receiving articles from said supply device;

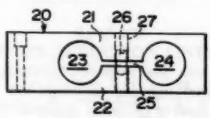
a plurality of weighing units respectively associated with said pool hoppers for weighing the articles contained in each pool hopper to provide in each pool hopper a batch of articles having a predetermined weight; and

a plurality of weighing hoppers, positioned below and respectively associated with said pool hoppers, for receiving the batches of articles from said pool hoppers, respectively, and combinatorially weighing the batches of articles.

4,515,232
PLATFORM TRANSDUCER BEAMS

Randall B. Rubinstein, Sharon, Mass., assignor to Hottinger Baldwin Measurements, Inc., Framingham, Mass.

Filed Nov. 7, 1983, Ser. No. 548,989
Int. Cl.³ G01G *23/02, 3/14*
U.S. Cl. 177—154 6 Claims



1. A device for protecting a platform load cell having at least one slot between two load cell sections, against damage, comprising a threaded hole having axially aligned hole portions on both sides of said slot in each load cell section, and a removable safety screw in both hole portions, said removable safety screw extending through said slot to interconnect said load cell sections substantially rigidly with each other prior to any sensing function to be performed by said load cell.

4,515,233
UNIVERSAL AUTOMOTIVE BATTERY HOLDDOWN SYSTEM

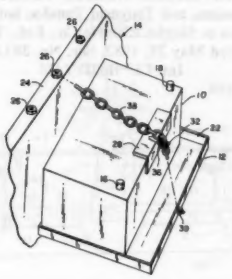
Joseph D. Silverstein, 51 Sagebrush La., S. Hauppauge, N.Y. 11722

Filed Sep. 20, 1982, Ser. No. 420,039
Int. Cl.³ B62D *25/00*
U.S. Cl. 180—68.5 3 Claims

1. In a motorized vehicle, apparatus for clamping in place a battery resting on a platform secured to a vertical body portion of said vehicle, said battery abutting one side of said platform comprising:

a. means for straddling one upper edge of said battery opposite the abutting side of said battery;

b. means for retaining said battery securely in place on said platform comprising a single, elongated, flexible member, one end of said member being attached to one edge of said platform on the same side of said battery as said straddling means, the other end of said member being attached to a point on the body portion of said vehicle spaced above said battery and located such that said elongated member passes over said straddling means; and

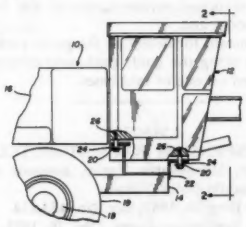


c. means on said straddling means for engaging said elongated member and including means for rendering said elongated member taut so as to maintain said battery firmly and securely in place, said straddling means being an L-shaped bracket mounted on said edge of said battery, and said engaging means comprising a threaded bolt fixedly connected at one end to the top of said bracket and extending horizontally past the edge of said bracket, and a nut thereon for contacting said elongated member, said elongated member straddling said bolt and being rendered taut by the rotation of said nut outwardly along said bolt.

4,515,234
STABILIZING AND ISOLATION SYSTEM FOR A VEHICLE CAB

Robert E. Loy, Bucyrus; Dale R. Phillips, Crestline, both of Ohio, and Paul E. Willis, Orrstown, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 15, 1983, Ser. No. 514,115
Int. Cl.³ B62D *27/04*
U.S. Cl. 180—89.12 4 Claims



1. A stabilizing and isolation system for mounting an operator cab on a vehicle frame comprising:

means disposed between the underside of the cab and the frame for resiliently supporting the cab on the frame;

a stabilizer linkage assembly connected to said frame and said cab for restraining rolling and pitching motion of said cab relative to said frame, said assembly including resilient means to permit relative vertical motion between said cab

and said frame, said stabilizer linkage assembly comprising an essentially triangularly shaped plate extending in a horizontal plane between said cab and said frame, the apex of the plate being secured to a side of said cab and the base of the plate being secured to said frame; and

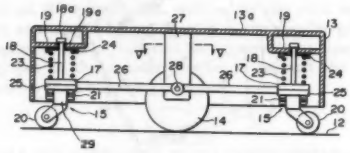
motion limiting means connected to the frame and the cab for restraining vertical displacement of the cab relative to the frame in the event said resilient support means and said stabilizer linkage assembly should fail during a catastrophic event.

4,515,235

DRIVERLESS GUIDED VEHICLE

Kiwamu Yamamoto, and Tsuyoshi Tanaka, both of Tokyo, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,884
Int. Cl.³ B62D *1/28*
U.S. Cl. 180—168 **3 Claims**



1. A driverless guided vehicle movable along a guide path on a floor which vehicle comprises:

(a) an elongated body including a pair of drive wheels disposed intermediate opposite ends thereof;

(b) a pair of wheel support devices mounted on the opposite ends of said body, respectively, each of said wheel support devices comprising a base supporting a driven wheel for rotation about a horizontal axis, and a coil spring interposed and acting between said body and said base for permitting vertical movement of said wheel support device relative to said body, said driven wheel being in the form of a caster rotatable about a vertical axis;

(c) a pair of arms extending horizontally along the length of said body and fixedly secured at their one ends to said bases, respectively;

(d) a mounting plate mounted on said body intermediate opposite ends thereof, said pair of arms being connected together at their other ends and pivotally mounted on said mounting plate by a horizontally-disposed pin extending through the other ends of said arms and said mounting plate; the axis of said pin being disposed in a vertical plane in which the axis of each drive wheel lies, and said vertical plane being disposed perpendicular to the longitudinal axis of said body; and

(e) a detecting means for detecting the guide path and sensible markings along the guide path, said detecting means being mounted on one of said bases.

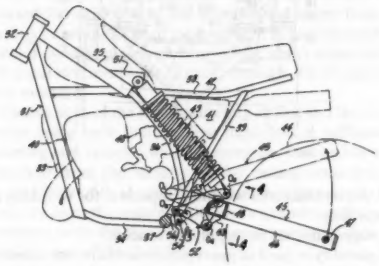
4,515,236

REAR SUSPENSION FOR MOTORCYCLES

Takashi Kanamori, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Dec. 28, 1982, Ser. No. 453,934
Claims priority, application Japan, Dec. 29, 1981, 56-214668
Int. Cl.³ B62K *25/04*
U.S. Cl. 180—227 **3 Claims**

1. A rear suspension for a motorcycle comprising a suspension arm supported for pivotal movement about a first pivot axis that extends transversely to said motorcycle, a rear wheel journalled by said suspension arm for rotation about an axis that is parallel to said first axis, and a suspension element for yieldably resisting pivotal movement of said suspension arm, the improvement comprising linkage means for loading said suspension element upon pivotal movement of said suspension arm comprising a bellcrank having its intermediate pivotal connection to said suspension arm for pivotal movement about a second pivot axis that is disposed rearwardly from said first pivot axis and below a line interconnecting said first pivot axis with said wheel axis of rotation, one arm of said bellcrank having a pivotal connection to one end of said suspension element about a third pivot axis for loading said suspension element upon pivotal movement of said bellcrank about said second pivot axis, said third pivot axis being disposed rearwardly of said second pivot axis and above the line connecting said first pivot axis with said wheel axis of rotation, the other arm of said bellcrank having a connection to one end of a link at a fourth pivot axis, said fourth pivot axis lying forwardly of said second and third pivot axis and being disposed below the line interconnecting said first pivot axis with said wheel rotational axis, and means connecting the other end of said link to said motorcycle for pivotal movement about a fixed fifth pivotal axis that is disposed below the line connecting said first pivot axis and said rear wheel axis and to the rear of said fourth pivot axis when said vehicle is unladened.

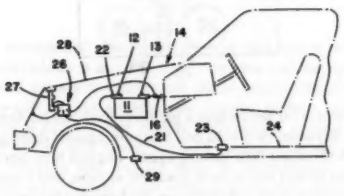


4,515,237

AUTOMOBILE SECURITY SYSTEM

Jose Gonzalez, and Benito Gonzalez, both of 2676 Cromwell Row, South San Francisco, Calif. 94080

Filed Dec. 27, 1982, Ser. No. 453,285
Int. Cl.³ B60R *25/04*
U.S. Cl. 180—287 **4 Claims**



1. An automobile security system comprising,

an elongated insulated cable adapted for connection to a ground terminal of the automobile battery in place of the ground wire thereof,

an operating unit adapted for physical and electrically connection at a first electrically conducting portion thereof through a metal portion of an automobile body,

such operating unit having a second electrically conducting portion electrically insulated by a hollow insulator from said first portion and electrically connected to said cable,

an interior electrically conducting movable element disposed for movement into and out of electrical connection between said first and second portions through said hollow insulator by threaded engagement with the interior of

said first portion to controllably engage a surface of said second portion and

an operator adapted for insertion into said operating unit engaging said movable element for movement thereof into and out of electrical connection with said second portion of said operating unit to controllably disable all electrical circuits of said automobile.

4,515,238

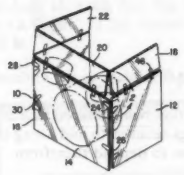
PORTABLE ACOUSTICAL SHIELD AND SOUND ENHANCING CLOSURE

Warren N. Baker, 3763 Lanier Dr., Baton Rouge, La. 70814

Filed Oct. 20, 1983, Ser. No. 543,773

Int. Cl.³ F04B *1/99*

U.S. Cl. 181—30 **9 Claims**



1. An acoustical shield and sound enhancing enclosure comprising a plurality of lower panel sections adapted to be arranged vertically at a desired angle to each other, said lower panel sections being provided on their front and rear surfaces with a plurality of strips of hook and loop material, each of said lower panel sections being connected to the next adjacent lower panel section by means of at least a pair of rotatable hinge bodies, each of said hinge bodies being provided on their interior surfaces with a layer of hook and loop material, said layers being adapted to communicate with said strips located on said lower panel sections, and a plurality of upper panel sections adapted to be disposed above said lower panel sections at a desired angle thereto, said upper panel sections being connected to said lower panel sections by means of a plurality of padded clamps, each of said padded clamps including two interconnected rigid bodies, each of said rigid bodies being provided with padding material on their interior surfaces.

4,515,239

NOISE REDUCTION LINING

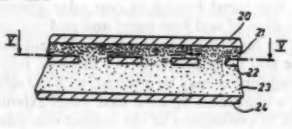
Georg Blatt, Ingolstadt; Johannes van den Boom, Kösching; Geert Kuipers, and Heinz Hollerweger, both of Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union A.G., Ingolstadt, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 531,946

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235539

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—290 **6 Claims**



1. Noise reduction lining, comprising: a base layer for supporting the lining, a cover layer extending in substantially parallel relationship to the base layer, and an absorption layer interposed between the base layer and the cover layer for absorbing noise impinging upon the base layer, wherein there is embedded within the absorption layer an extinction layer having at least one major surface extending in substantially parallel relationship to the cover layer and being provided with perforations, the absorption layer being such that its stiffness is different at another surface of the extinction layer than at the major surface of the extinction layer.

4,515,240

PERSONAL SAFETY DEVICE

John Curtis, 79 Baker Ave., Dover, N.J. 07801

Filed Feb. 14, 1983, Ser. No. 465,908

Int. Cl.³ A62B *1/14, 1/20*

U.S. Cl. 182—6 **8 Claims**

1. An escape device for allowing controlled descent by an escapee down a rope comprising:

a base;

at least one transverse handlebar mounted on said base, said handlebar having a threaded bore;

manually operable means mounted on said base for adjustably gripping said rope, said manually operable means including means threadably mounted on said base for setting the extent of gripping of said rope, said manually operable means comprising a threaded rod screwed into said bore of said handlebar; and

support means suspended from said base for supporting said escapee, said support means comprising a stirrup suspended from said base.

4,515,241

FLAG-POLE

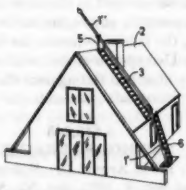
Sven R. V. Gebelius, Drottningholmsväg 195, Bromma, Sweden S-161 36

Continuation of Ser. No. 355,562, Feb. 17, 1982,. This application Mar. 21, 1984, Ser. No. 591,897

Claims priority, application Sweden, Jun. 23, 1980, 8004633; Sep. 1, 1980, 8006099

Int. Cl.³ E06C *1/38;* E04H *12/32*

U.S. Cl. 182—96 **8 Claims**



1. A flag-pole comprising:

an elongated tubular lower portion extending from the ground;

first pivot means to pivotably attach said lower portion adjacent to the ground plane so that said lower portion is tiltable from a substantially vertical first position to a second inclined position toward an adjacent building

where the upper end of said lower portion is adjacent the outer edge of a roof surface of the building;

an elongated upper portion;

second pivot means to pivotably attach said lower and upper portions together adjacent their upper and lower ends, respectively, so that said upper portion is tiltable about said second pivot means from a first position substantially aligned with said lower portion to a second inclined position at an angle to said lower portion extending in a direction substantially parallel to the roof of the building, said upper portion in said second inclined position functioning as a handrail for persons walking on the roof;

support means on the roof operatively engageable with said upper portion when in said second inclined position to support said upper portion during use as a handrail; and

means cooperatively associated with said lower portion to facilitate elevating a person along said lower portion from the ground to the roof.

4,515,242

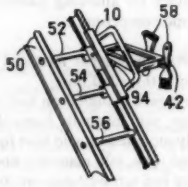
MOVABLE HAND RAILING AND TRAY FOR LADDERS

Paul LaChance, 100 Division St., Rockland, Mass. 02370

Filed Nov. 23, 1983, Ser. No. 554,786

Int. Cl.³ E06C *7/14, 7/18*

U.S. Cl. 182—106 **19 Claims**



1. A movable utility bracket for ladders comprising:

a sleeve contacting and conforming to a side rail of a ladder, wherein the sleeve extends over a length of the side rail equal to a distance between at least two ladder rungs and the sleeve covers a top edge and an external side of the side rail from the top edge to the bottom edge, and further covers, an interior side of the side rail to an edge of each of the rungs;

at least two hooks protruding interiorly from the sleeve, each of which hooks partially encircles one of the rungs over a top of the rung thereby providing a bracket which slides onto a ladder hooked over the rungs of the ladder securely but instantly removable to other rungs on the ladder;

a means of securing a utility device to the bracket for use by a person on the ladder, wherein the utility device comprises a handrail secured to the exterior of the bracket and protruding upwardly above the ladder for grasping by the person using the ladder, wherein the hand rail comprises a substantially U-shaped member with each of two arms of the U rigidly attached flat against the side of the sleeve.

4,515,243

SAWHORSE BRACKET

Herbert E. Prior, 17045 Arnold Dr., Sonoma, Calif. 95465

Filed Sep. 9, 1983, Ser. No. 530,516

Int. Cl.³ B27B *21/00*; F16M *11/00*

U.S. Cl. 182—155 **7 Claims**

1. A trestle comprising:

a beam of lumber;

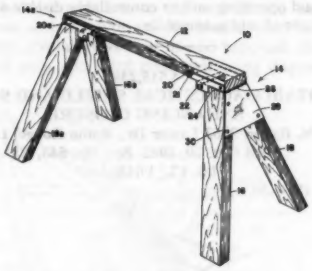
a leg assembly secured near each end of said beam;

each said leg assembly comprising:

first and second rigid plates;

said second plate being bent to form a depending portion at the outboard end thereof;

a hinge connecting the inboard end of said second plate to said first plate;



means securing said first plate to the underside of said lumber beam;

said depending portion being shaped as a trapezoid; and

a pair of lumber legs secured to and along the edges of said depending portion to depend therefrom.

4,515,244

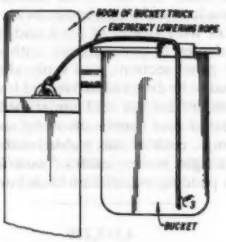
DIRECTION ALTERING DEVICE

Edward T. Kramer, R.D.-1, Box 401, Ashland, Pa. 17921

Filed Mar. 26, 1984, Ser. No. 593,113

Int. Cl.³ A62B *1/20*

U.S. Cl. 182—230 **3 Claims**



1. An apparatus for holding a rope or cable in a fixed position on a mounting surface which comprises:

a base panel having an upward extension;

a first side panel;

a second side panel;

said first and second side panels parallel to each other and each lying in a horizontal plane, said base panel and upward extension lying in a vertical plane;

said first side panel having its rear edge connected to the bottom edge of said base panel and said second side panel having its rear edge connected to the said base panel, so that the said three panels form a channel, into which said mounting surface may be inserted, with the said base panel having a connected upward base panel extension beyond the area of connection of the second side panel with the said base panel;

said upward base panel extension having a slot or groove in the top edge of said upward base panel extension, said slot or groove having such form that a rope or cable may pass through it;

tightening means mounted in one of the side panels and being movable in a plane perpendicular to the planes of the said side panels, so that when said mounting surface has been inserted into the said channel formed by the said three panels, the said tightening means can be moved so

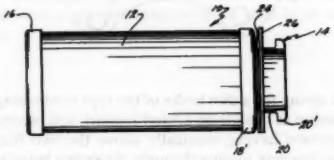
that it bears against one side of the mounting surface and causes the other side panel to bear against the other side of the said mounting surface, resulting in a secure attachment of the said apparatus with the said mounting surface.

4,515,245

OIL FILLER EXTENSION

Dennis E. Salmon, Cedar Springs, Mich., assignor to Rockford Enterprises, Inc., Rockford, Mich.

Filed Aug. 15, 1983, Ser. No. 522,962
Int. Cl.³ B67C *11/00*; F01M *11/04*
U.S. Cl. 184—105 R **1 Claim**



1. A sheet metal oil filler extension for providing an extended passageway to an opening of a conventional engine valve lifter cover having a cap connector, said cap connector including said opening at its periphery having a plurality of cut outs for receiving the bosses on the neck portion of a conventional cap and a depending flange providing camming ramps with tapered undersurfaces over which the bosses of said cap cam and follow to retain the cap on said valve lifter cover comprising:

an elongated substantially rigid sheet metal tube;

an annular sheet metal fitting secured to one end of said tube, said fitting including a cylindrical collar fitted on and secured to one end of the tube; a flange extending radially inwardly from said collar and defining a central opening communicating with the opening through said tube; a neck extending from said flange and having a smaller diameter than the diameter of said tube, said neck corresponding in shape to the neck portion of said conventional cap thereby having a plurality of bosses extending radially therefrom for attachment of said fitting and tube to a conventional oil filler opening of an engine valve lifter cover;

seal means for sealing said fitting within the valve lifter cover;

a second annular sheet metal fitting comprising a cap connector secured on the other end of said tube, said cap connector having a U-shaped cross-sectional configuration at its periphery thereby providing two concentric inner and outer flanges connected together by a bight portion and defining a central opening communicating with the opening through said tube; said outer flange being secured to said other end of said tube and said inner flange having tapered under surfaces providing camming ramps;

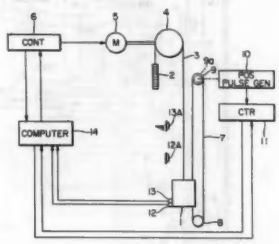
said bight portion and said inner flanges having a plurality of cut outs for receiving the bosses on the neck portion of a conventional cap and said camming ramps providing tapered undersurfaces over which the bosses of said cap cam and follow to retain a conventional removable cap on said metal tube.

4,515,246

APPARATUS FOR CONTROLLING THE ARRIVAL OF AN ELEVATOR CAGE AT AN ELEVATOR FLOOR

Ryuichi Kajiyama, Inazawa, and Masashi Yonemoto, Nagoya, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,514
Claims priority, application Japan, Feb. 23, 1982, 57-27689
Int. Cl.³ B66B *1/18*
U.S. Cl. 187—29 R **10 Claims**



1. Apparatus for controlling the arrival of an elevator cage at an elevator floor including a computer in which the present position of the elevator cage is calculated according to pulses generated whenever the cage runs a certain distance, the present position of said cage is subtracted from the position of a target floor where the cage is to be stopped and stored in advance as the absolute position from a reference position calculated as the remaining distance to said target floor, and a calculated deceleration instruction value corresponding to the calculated remaining distance is produced to control the running speed of the cage to decelerate and stop said cage at said target floor, said target floor having a position detecting means disposed to be activated when said cage arrives at a predetermined distance before said target floor, and said computer including an arithmetic unit for maintaining said calculated deceleration instruction value until said position detecting means is activated.

4,515,247

ELEVATOR SYSTEM

William R. Caputo, Wyckoff, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1984, Ser. No. 578,338
Int. Cl.³ B66B *1/30*
U.S. Cl. 187—29 R **8 Claims**

1. An elevator system, comprising:

a building having a plurality of floors and a hatchway,

an elevator car mounted for movement in the hatchway of said building to serve the floors,

motive means for said elevator car,

landing zone means mounted in the hatchway of said building to establish a landing zone adjacent to each floor served by said elevator car,

landing zone detector means mounted on said elevator car,

said landing zone means and said landing zone detector means cooperatively detecting the position of said elevator car as the elevator car approaches a floor at which it is going to stop,

said landing zone means establishing spaced absolute car position points in each landing zone,

said landing zone detector means detecting each of said spaced absolute car position points and providing a predetermined absolute car position signal in response thereto,

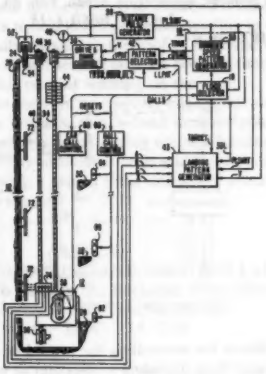
storage means storing a discrete landing speed pattern value for each absolute car position point of said landing zone means,

said means providing a landing speed pattern for said motive means,

said landing speed pattern including a discrete landing speed pattern value obtained from said storage means in response to the generation of each predetermined absolute car position signal,

said discrete landing speed value being modified by additional landing speed pattern values provided in the interval between the generation of successive absolute car position signals,

said additional landing speed values being generated as a function of the latest discrete landing speed pattern value, the next discrete landing speed pattern value, and the distance traveled by the elevator car between the latest and the next absolute car position points.

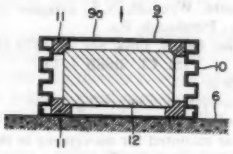


4,515,248

BUFFER DEVICE FOR ELEVATOR

Kazutoshi Ohta, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,085
Claims priority, application Japan, Oct. 8, 1981, 56-160770
Int. Cl.³ B66B *5/28*
U.S. Cl. 187—67 **12 Claims**



1. An elevator comprising:

a cage frame having a floor, spaced vertical support posts, and a buffer receiver opposed to said floor; and

a buffer having an upper surface below and aligned with a lower surface of said buffer receiver so as to mate therewith and uniformly receive the weight of said cage frame when said cage frame falls vertically downwardly thereon;

said buffer including

a box formed of thin non-combustible material having said upper surface,

a compressible box-shaped buffer member formed of foamed plastic material accommodated in said box, spaced from the peripheral walls thereof, and

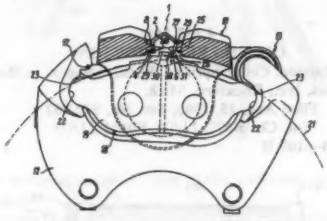
heat-insulating material disposed between said peripheral walls of said box and said foamed plastic material.

4,515,249

SPRING FOR PADS OF A DISC BRAKE WITH A SLIDING CALLIPER, AND DISC BRAKE EQUIPPED WITH SUCH A SPRING

Gislain Escarabajal, Clichy s/Bois, and Jean-Charles Maligne, Aubervilliers, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jul. 11, 1983, Ser. No. 512,826
Claims priority, application France, Jul. 22, 1982, 82 12805
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—73.38 **13 Claims**



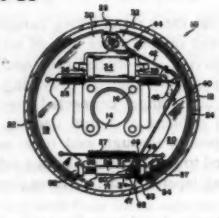
1. A spring for a disc brake of the type comprising a calliper mounted so as to slide on a fixed support, and incorporating an arch portion having, vertically above the two friction brake pads, an opening passing through, the spring being intended to be interposed between the arch portion of the calliper and the friction pads so as to exert on the latter at least a radial force directed essentially towards the axis of the disc and consisting of a central portion arranged to be entered into the opening in the arch portion, extended by lateral portions capable of cooperating with an inner face of the arch for elastic mounting on the calliper, and a bearing portion cooperating, in the operating position of the brake, with adjacent upper edges of the friction pads, characterized in that the spring is shaped to take the form of two parallel hoops each essentially in the shape of a letter C, constituting said central portion, each hoop having end zones extended by first and second feet, respectively, folded angularly in the same direction relative to the plane of the hoop, the feet of the two hoops extending in opposite directions and constituting said lateral portions, the first feet of the hoops being joined to one another by a tiebar extending perpendicular to the plane of the hoops and constituting said bearing portion.

4,515,250

SPRING CLUTCH FOR DUO-SERVO DRUM BRAKE

Robert Spaargaren, Granger, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Jan. 20, 1984, Ser. No. 572,489
Int. Cl.³ F16D *65/38*
U.S. Cl. 188—79.5 GT **12 Claims**



1. In a drum brake, a backing plate for mounting on a non-rotating portion of a vehicle, a drum mounted for rotation with a member to be braked, a pair of brake shoes slidably mounted

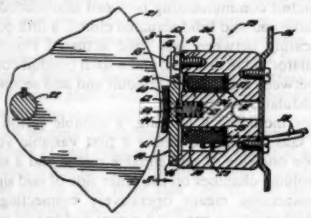
on said backing plate and in end-to-end relationship, fluid motor means for urging said brake shoes into frictional engagement with said drum, resilient means for yieldably urging said brake shoes away from said drum, an extendible adjusting strut between adjacent ends of said shoes, said adjusting strut including means for effecting extension of said strut upon actuation of the extension means which includes first and second clutch means engaging said strut, a force transmitting member interconnecting the backing plate, one of said shoes, and the extension means, the force transmitting member including an adjuster connector, and means for returning the adjuster connector toward an initial position, whereby movement of said one shoe toward the drum and in excess of a predetermined amount effects an actuating force through the force transmitting member and connector to actuate the first clutch means which engages the strut to effect rotation in one direction thereof and thereby extend the strut and adjacent ends of said shoes, and movement of said one shoe away from the drum effects rotatable disengagement of the first clutch means from said strut substantially simultaneously with the second clutch means engaging said strut to prevent rotation of the strut in an opposite direction.

4,515,251

ELECTROMAGNETIC BRAKE WITH IMPROVED ARMATURE MOUNTING

Thomas J. Wruk, Belvidere, Ill., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Jan. 26, 1983, Ser. No. 461,115
Int. Cl.³ B60T *13/04*; H01F *7/14, 7/16*
U.S. Cl. 188—171 **11 Claims**



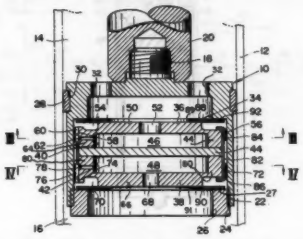
1. An electromagnetic brake for retarding a rotary member adapted to rotate about a predetermined axis, said brake comprising a field shell having at least two magnetic poles, an armature, spring means for urging said armature away from said poles and into braking engagement with the rotary member, and an electric coil supported by said shell and operable when excited to produce magnetic flux for drawing said armature away from the rotary member and toward said poles, the improvement in said brake comprising, a substantially flat and resiliently flexible leaf spring having a longitudinal axis which extends substantially parallel to the axis of the rotary member, said leaf spring having end portions fixed to said shell and having an intermediate portion fixed to one end portion of said armature, the intermediate portion of said leaf spring being capable of twisting relative to the end portions of the leaf spring to mount said armature for swinging toward and away from said poles about an axis coinciding with the longitudinal axis of the leaf spring.

4,515,252

PISTON STROKE RESPONSIVE VORTEX-FLOW SHOCK ABSORBER

Kunihiko Hidaka, Yokohama; Naoto Fukushima, Kamakura, and Kazuro Iwata, Zushi, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 25, 1983, Ser. No. 498,135
Claims priority, application Japan, May 31, 1982, 57-92604
Int. Cl.³ F16F *9/34*
U.S. Cl. 188—282 **7 Claims**



1. A vortex-flow shock absorber for damping relative displacement of two components, comprising:

a hollow cylinder filled with a working fluid and fixed to one of said components for movement therewith;

a piston sealingly disposed within said hollow cylinder for axial movement and defining upper and lower fluid chambers in said cylinder; said piston being fixed to the other of said components for movement therewith;

means defining a fluid passage through said piston through which working fluid may pass between said upper and lower fluid chambers; said fluid passage comprising a first vortex chamber for producing vortex fluid flow which creates a damping force during a piston expansion stroke and a second vortex chamber for producing vortex fluid flow which creates a damping force during a piston compression stroke;

means responsive to a working fluid pressure difference between said upper and lower fluid chambers exceeding a first predetermined value for permitting a flow of working fluid through said piston to bypass one of said vortex chambers; and

means responsive to a working fluid pressure difference between said upper and lower fluid chambers exceeding a second predetermined value greater than said first value for permitting a flow of working fluid through said piston to bypass the other of said vortex chambers.

4,515,253

DAMPING FORCE GENERATING DEVICE FOR AN OIL DAMPER

Hidekuni Itoh, Shizuoka, Japan, assignor to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,876
Claims priority, application Japan, Apr. 16, 1982, 57-63627
Int. Cl.³ F16F *9/44*
U.S. Cl. 188—314 **7 Claims**

1. A damping force generating device for an oil damper including a hydraulic cylinder, a sub-tank having in the interior thereof an oil chamber and a gas chamber, and a first oil passage which hydraulically connects said hydraulic cylinder to said oil chamber in said sub-tank, comprising:

a valve seat disposed in an end plate of said sub-tank forming part of said first oil passage, said valve seat having at least one second oil passage for passing therethrough an operating oil when it is flowing in a first direction from said hydraulic cylinder toward said oil chamber in said sub-tank and at least one third oil passage for passing therethrough said operating oil when it is flowing in a second

direction from said oil chamber in said sub-tank toward said hydraulic cylinder;

first valve means for opening said second oil passage when said operating oil flows in said first direction and closing said second oil passage when said operating oil flows in said second direction;

second valve means for closing said third oil passage when said operating oil flows in said first direction and opening said third oil passage when said operating oil flows in said second direction; and

said first and second valve means each being disposed in said end plate of said sub-tank.

4,515,254

DEVICE FOR DAMPING IMPACT LOAD

Vladimir A. Markov; Vladimir N. Filatov; Ilya S. Kernasovsky, and Ljudmila V. Gorina, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Textilno-Galantereinoi Promyshlennosti, Moscow, U.S.S.R.

PCT No. PCT/SU82/00008, § 371 Date Sep. 30, 1983, § 102(e) Date Sep. 30, 1983, PCT Pub. No. WO83/02903, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 24, 1982, Ser. No. 552,180

Int. Cl.³ A62B *35/00*

U.S. Cl. 188—371 **9 Claims**

1. A device for damping impact load in a safety system, comprising a flexible band (1) having two free ends and made up to two layers, which are formed by said band being folded back, which band is associated with an energy-absorbing means, characterized in that the energy-absorbing means is fashioned as a plurality of loops (2) from an elastic long-sized material, said loops being fastened on the band (1) throughout its length on one side thereof and being interposed between the layers of the band, all the loops (2) of the band layers being interlinked consecutively through tricot knit capable of unknitting in a direction opposite to the direction of load application.

4,515,255

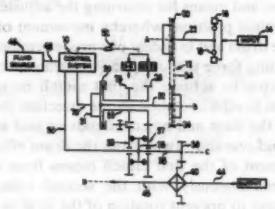
HYDRAULIC CONTROL SYSTEM FOR A CLUTCH AND TRANSMISSION

William J. Haley, and Guenter J. Neumann, both of Sterling Heights, Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 6, 1982, Ser. No. 405,797

Int. Cl.³ B60K *41/22*

U.S. Cl. 192—3.57 **10 Claims**



1. A fluid control system for use in the combination which includes an input member, a continuously variable transmission connected to drive the input member, an output member, first and second drive trains, a fluid-actuated clutch engageable for coupling said input member with the selected one of said drive trains, and means for selectively engaging one of said drive trains with said output member to establish a torque delivery path from said input member to said output member, said fluid control system comprising:

a first fluid control valve, a second fluid control valve, a pressure modulator valve with a first end and a second end, a first conduit communicating between said first and second control valves, an input conduit communicating between a source of fluid at a line pressure and said modulator valve, a sump for receiving fluid at a second pressure lower than said line pressure, a second conduit communicating between said modulator valve and said first fluid control valve, a third conduit communicating between said sump and said first and second fluid control valves, a fourth conduit communicating between said second fluid control valve and said fluid actuated clutch, a fifth conduit communicating between said fluid actuated clutch and said modulator valve first end, and a sixth conduit communicating between said second conduit and said second end of said modulator valve;

a fluid motor including a housing, a slidable piston positioned in said housing to define a first variable volume chamber on one side of said slidable piston and a second variable volume chamber on the other side of said slidable piston, connecting means operatively connecting said piston to said selective engaging means and to said second fluid control valve;

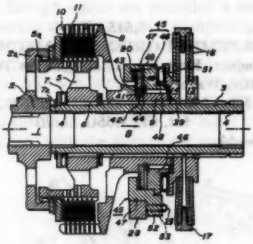
a seventh and an eighth conduit communicating between said first fluid control valve and said fluid motor first and second variable volume chambers, respectively, to supply fluid under pressure to move said fluid motor, said second fluid control valve, and said engaging means to effect selective engagement of one of said drive trains,

movement of said second fluid control valve initially interrupting fluid flow to said clutch and thereafter completing a fluid flow path for fluid communication from said input conduit through said modulator valve and said first and second fluid control valves to move said fluid-actuated clutch to engagement only after selective engagement of one of said drive trains for completion of said torque delivery path between said input and output members, and fluid pressure from said fluid actuated clutch providing, through said fifth conduit, a biasing force to said modulator valve first end to control flow through said modulator valve.

4,515,256
CLUTCH AND BRAKE UNIT

Seiichi Kitano, Shijyonawate, and Yukio Ono, Katano, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Dec. 29, 1981, Ser. No. 335,330
Claims priority, application Japan, Jan. 20, 1981, 56-7113
Int. Cl.³ F16D 67/02
U.S. Cl. 192—18 R 4 Claims



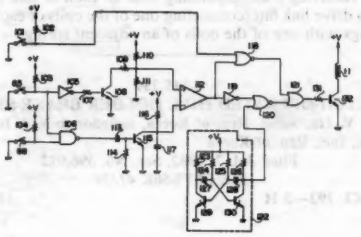
1. A clutch and brake device comprising:
an input shaft having an axis,
an output shaft aligned with said axis,
a clutch hub rotationally connected to said input shaft,
a clutch case spline mounted on said output shaft and axially movable therealong between a first position engaging said clutch hub and a second position not engaging said clutch hub,
spring means urging said clutch case towards said first position, said spring means including a first spring guide spline fitted on and axially movable along said output shaft, first springs urging said first spring guide towards said clutch case, and a second spring interposed between said first spring guide and said clutch case urging said clutch case towards said first position, a spring means side end surface of said clutch case contacting said second spring,
an annular friction plate having a frictional surface extending radially and axially therewith,
non-rotating means for moving said clutch case from said first position to said second position against the urging of said spring means, said non-rotating means including an axially-movable release sleeve having a frictional surface formed thereon facing said frictional surface of said annular friction plate with a clearance therebetween when said clutch case is in said first position,
a thrust bearing interposed between a spring means side end surface of said release sleeve and said first spring guide,
whereby when said non-rotating means is operated to move said clutch case from said first to said second position disengaging said clutch case from said clutch hub, said frictional surfaces contact each other to brake said clutch case and said output shaft.

4,515,257
CONTROL SYSTEM FOR AN ELECTROMAGNETIC CLUTCH FOR AUTOMOBILES

Toshio Takano, Hamuramachi, and Ryuzo Sakakiyama, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1982, Ser. No. 445,298
Claims priority, application Japan, Dec. 4, 1981, 56-195390
Int. Cl.³ B60K 41/02; F16D 27/00
U.S. Cl. 192—0.075 18 Claims

1. A control system for a belt-drive automatic transmission for an engine of the type which comprises a driving pulley, a driven pulley and a belt engaged with both pulleys, transmission ratio of which is automatically varied by changing effective diameters of both said pulleys, comprising
an electromagnetic clutch having a coil, said electromagnetic clutch being operatively connected between said engine and an input shaft of said automatic transmission,
said electromagnetic clutch being engaged by exciting said coil for transmitting output of said engine to the input shaft of said automatic transmission,
means comprising a switch for being operated when an accelerator pedal of said engine is rapidly released to an idling position,

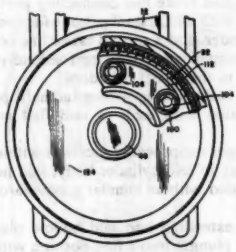


gate circuit means opened depended on operation of said switch for a predetermined time period,
circuit means for allowing the current to flow periodically through said coil during the opening of said gate circuit means, and wherein
said gate circuit means includes a time constant circuit for producing a signal to open a gate for a predetermined time period.

4,515,258
CLUTCH DRIVE WITH LINK SPRING

Duane R. Johnson, Oberlin, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 9, 1983, Ser. No. 473,425
Int. Cl.³ F16D 3/14, 13/30, 25/08
U.S. Cl. 192—91 A 8 Claims



1. Clutch drive comprising a spindle having an axis, a driving member and a driven member mounted for rotation about the axis of the spindle, pressure responsive means for effecting engagement and disengagement of the driving and driven members to effect a driving connection between the driving and driven members when said members are engaged and to break said driving connection when the members are disengaged, one of said members, including a portion movable parallel to the axis of said spindle and another portion fixed against axial movment relative to said spindle, first and second bearing means rotatably supporting said parallel movable portion and said fixed portion respectively for rotation about said spindle, and resilient means yieldably urging said parallel movable portion into driving engagement with said other member, said resilient means being disposed between said parallel movable portion and said fixed portion of said one member to provide a drive path solely through said resilient means to

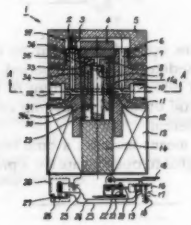
transmit rotation between the portions of said one member, whereby said resilient means act both to transmit rotation between the portions of said one member and to yieldably urge said parallel movable portion into driving engagement with said other member, said portions having circumferentially spaced bosses extending parallel to the axis of said spindle and projecting toward corresponding bosses on the other portion but being separated therefrom, said resilient means comprising circumferentially spaced coiled springs having opposite open ends receiving a corresponding boss on each of said portions, and a drive link interconnecting one of the coils of each of said springs with one of the coils of an adjacent spring.

4,515,259

CLUTCH-OPERATED HILL HOLDER BRAKE SYSTEM

Jung Y. Ha, Seoul, Rep. of Korea, assignor to KIA Industrial Co., Inc., Rep. of Korea

Filed Jul. 7, 1982, Ser. No. 396,012
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—3 H **13 Claims**



1. A brake control device for preventing backward movement of a vehicle on an uphill road during operation of a clutch pedal of the vehicle after release of a brake pedal of the vehicle which is connected to a master cylinder and wheel cylinders of the vehicle, said brake control device comprising:

a cylinder body provided with first and second lateral oil passages, a first brake line connecting port in flow communication with said first oil passage for connection to the master cylinder, and a second brake line connecting port in flow communication with said second oil passage for connection to the wheel cylinders;

said cylinder body having a longitudinal opening in flow communication with each of said first and second oil passages;

a hollow plunger reciprocably received within said longitudinal opening of said cylinder body, said hollow plunger being provided with an annular groove around a periphery thereof;

spring means extending into said hollow plunger to force said hollow plunger into a first position with said annular groove in alignment with each of said first and second oil passages to provide flow communication therebetween so that oil can flow from the master cylinder through said first brake line connecting port, said first oil passage, said annular groove, said second oil passage, said second brake line connecting port, respectively, to the wheel cylinders when the brake pedal is actuated;

first means to move said hollow plunger against the force of said spring means into a second position with said annular groove out of alignment with each of said first and second oil passages to prevent flow communication therebetween so that the oil is prevented from returning from the wheel cylinders when the clutch pedal is actuated upon release of the brake pedal;

said first means including an electromagnetic core provided with an electromagnetic coil wound therearound, said electromagnetic core being mounted on said cylinder body for acting on said hollow plunger;

micro switch means electrically connected to said electromagnetic coil and positioned under the clutch pedal for energizing said electromagnetic coil when the clutch pedal is actuated; and

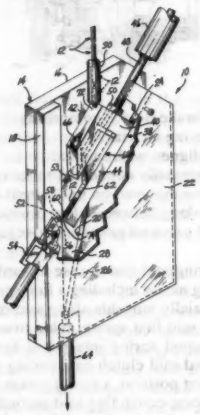
second means provided in said cylinder body to provide a second oil path from the master cylinder to the wheel cylinders to supply additional oil to the wheel cylinders when said hollow plunger is in said second position and the brake pedal is reactuated for an increased braking force.

4,515,260

ESCAPEMENT ORIENTING MECHANISM

David L. Wagner, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 28, 1983, Ser. No. 479,379
Int. Cl.³ B65G *11/20*
U.S. Cl. 193—44 **4 Claims**



1. An apparatus for aligning fasteners having a deep recess on one end and a shallow recess on the other end, with the apparatus comprising: means for introducing one fastener at a time onto a reciprocally movable inclined surface, a movable pin located to contact a lower end of the fastener, means for retracting the inclined surface a predetermined amount to clear the fastener to permit the fastener to rotate on the end of the pin into a shallow recessed end down position provided a deep recessed end of the fastener was resting on the pin and provided the shallow recessed end of the fastener was resting on the pin to support the fastener adjacent the other end, and means for rapidly retracting the pin to permit the shallow recessed end to drop down.

4,515,261

MOUNTING MEANS FOR DROP COIN MECHANISM

Simon Prisant, San Francisco, Calif., assignor to Coinamatic Leasing Corporation, Quebec, Canada

Filed Jan. 10, 1983, Ser. No. 456,822
Int. Cl.³ G07F *9/00*
U.S. Cl. 194—1 A **11 Claims**

1. In combination:

first and second plates adapted to sandwich between them a panel to which they are to be affixed,

the first plate having at least one boss projecting from one face thereof, and a threaded stub shaft spaced from said boss, the boss defining a lip spaced from said one face, at least part of said lip being directed generally toward said threaded stub shaft,

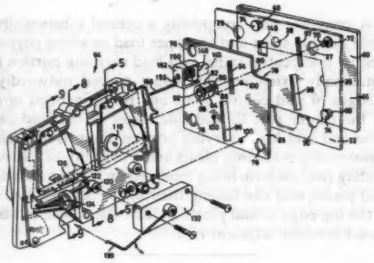
the second plate defining a first edge adapted to be received

under said lip, and a second edge adapted to lie adjacent said threaded stub shaft,

the combination further including a threaded nut for engagement with said threaded stub shaft, the threaded nut having a conical shoulder portion adapted to bear against said second edge of the second plate in such a manner as (1) to urge the second edge toward the first plate, and (2) to retain the first edge under said lip.

9. A method of affixing a drop coin mechanism to a panel of a coin-operated machine, the drop coin mechanism including a mounting plate through which are provided a coin insertion slot and a coin return slot, the method comprising the steps:

(a) providing an outer plate having at least one boss projecting from one face thereof, and a threaded stub shaft spaced from said boss, the boss defining a lip spaced from said one face, at least part of said lip being directed generally toward said threaded stub shaft, the outer plate having slots for registry with the slots of the mounting plate,



(b) providing on said mounting plate a first edge adapted to be received under said lip, and a second edge adapted to lie adjacent said threaded stub shaft,

(c) providing the panel with removed portions for registry with the slots, said at least one boss and said threaded stub shaft,

(d) in any order:

(1) placing the outer plate against one face of the panel with said at least one boss projecting across the panel,

(2) placing the mounting plate against the other face of the panel with said first edge received under said lip and said second edge lying adjacent said threaded stub shaft,

(e) engaging with said stub shaft a nut member having a conical shoulder portion, such that the conical shoulder portion comes into bearing engagement with said second edge of the mounting plate in such a manner as (1) to urge the second edge toward the outer plate, and (2) to retain the first edge under said lip.

4,515,262

COIN SLIDE

Evan C. Wilfong, and Tesfaye Anno, both of Philadelphia, Pa., assignors to Equipment Systems & Devices, Inc., Philadelphia, Pa.

Filed Mar. 28, 1983, Ser. No. 479,188
Int. Cl.[3] G07F *5/06*
U.S. Cl. 194—1 G **19 Claims**

1. A coin slide including a body and a flange adapted to be mounted upon a vending machine, comprising

a slide means movable relative to the body between a forward coin receiving position and a rearward vending position,

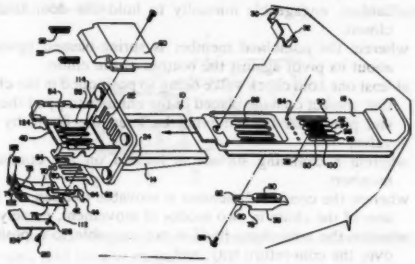
the slide means being provided with a plurality of longitudinally aligned coin receiving openings;

said coin receiving openings being respectively sized to receive and pass therethrough a coin of predetermined size;

lever checking means operatively secured to the body rearwardly of the flange, the lever checking means comprising pivotal levers,

the levers of the lever checking means being contacted by coins as the slide means is moved rearwardly toward the said vending position; and

coin stripper means secured to the body in partial registry with the lever checking means,



coin stripper means comprising a coin stop and a spring arm secured to the coin stop,

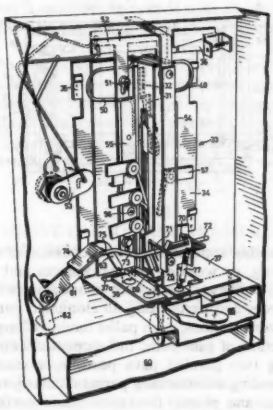
the coin stop being positioned forwardly of the coins when the slide means is moved to the vending position, whereby the coins cannot be urged forwardly of the coin stop after the slide means has been moved to the vending position prior to dropping into a cash box.

4,515,263

COIN OPERATED MECHANISM FOR OPENING THE DOOR OF A CABINET

Archibald R. Facto, 17 Lormar Dr., Toronto, Ontario, Canada M9B 4V7

Filed May 19, 1983, Ser. No. 496,019
Int. Cl.[3] G07F *9/04*
U.S. Cl. 194—1 D **25 Claims**



1. Coin-responsive mechanism for opening the door of a cabinet, comprising:

an accepted-coin tray and a coin-return tray;

at least one coin-chute;

a manually operable coin-return means;

the door of the cabinet being normally latched closed, unlatching means being provided to unlatch the door in dependence upon the presence of correct coinage in the chute;

a combined chute closure member and latch member,

mounted on a pivot which is itself mounted on the door, so that when the door moves the combined member is constrained to move in unison;

wherein the combined member is normally disposed in position at the bottom of the chute such that a coin placed in the chute falls down the chute and comes to rest against the combined member;

wherein the combined member is engageable with a complementary latch member mounted on the fixed part of the cabinet, engageable normally to hold the door latched closed;

wherein the combined member is spring-biassed upwards about its pivot against the bottom of the chute;

at least one coin check valve being so positioned in the chute that correct coinage placed in the chute is trapped therein and prevented from moving back up the chute by the valve;

wherein a camming surface is formed on the combined member;

wherein the combined member is movable to open the bottom of the chute in two modes of movement, namely:

wherein the coin-chute itself is not movable to a position over the coin-return tray; and

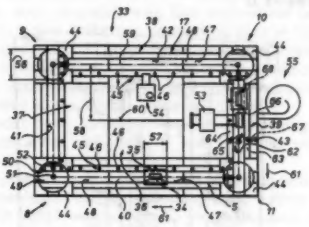
wherein the manually operable coin-return means includes a movable member having a tappet which is engageable with the combined member upon operation of the coin-return means and is effective to press the combined member downwards away from the bottom of the chute, against the spring biassing.

4,515,264

ASSEMBLY LINE

Walter Sticht, Attnang, Austria, assignor to Stiwa-Fertigungstechnik Sticht Gesellschaft M.B.H., Attnang, Austria

Filed Feb. 22, 1983, Ser. No. 468,168
Claims priority, application Austria, Mar. 5, 1982, 868/82
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—344 **10 Claims**



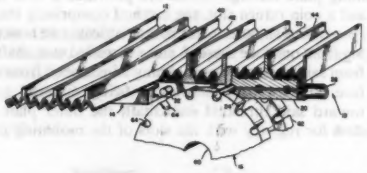
1. An assembly apparatus with a succession of work stations for assembling, or working on, workpieces and parts, which comprises a conveyor means for conveying pallets carrying the workpieces and parts along an elongated path to the succession of work stations, each pallet having a length extending in the direction of said path, the elongated conveyor means path having two parallel path portions, a connecting path portion extending substantially perpendicularly to the parallel path portions and pivotal conveyor means sections arranged between the parallel and connecting path portions, the length of the pivotal conveyor means sections corresponding substantially to the pallet length, each work station being equipped with its own conveyor means drive means and manipulating means for assembling, or working on, the workpieces and parts, the pivotal conveyor means sections being equipped with conveyor means drive means constituted by conveyor rollers rotatable about a vertical axis, a pivoting drive for each one of the pivotal conveyor means sections, and motion-transmitting means connecting the conveyor rollers and the pivoting drive of each pivotal conveyor means section.

4,515,265

BELT CONVEYER SYSTEM AND CONVEYER BELT USABLE THEREWITH

Daryl G. Hill, P.O. Box 9308, Yakima, Wash. 98909

Filed Aug. 18, 1982, Ser. No. 409,179
Int. Cl.³ B65G *15/08, 15/40*
U.S. Cl. 198—821 **21 Claims**



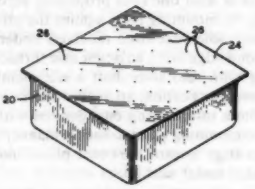
1. A conveyer belt comprising a central substantially inextensible flexible spine and an upper load carrying portion supported by said central spine, said load carrying portion having longitudinally extending side edges spaced outwardly from side edges of said central spine and being inclined upwardly from the center part to said side edges of the load carrying portion and said load carrying portion comprising a plurality of transversely extending pleats and a plurality of transversely extending ribs, each rib being mounted on top of a different one of said pleats, said ribs having their upper edge located higher than the top edge of said pleats, at least one of said pleats being disposed between adjacent ribs.

4,515,266

MODIFIED ATMOSPHERE PACKAGE AND PROCESS

Richard A. Myers, Dallas, Tex., assignor to St. Regis Corporation, New York, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,710
Int. Cl.³ B65D *81/20, 85/34*
U.S. Cl. 206—205 **6 Claims**



4. A package for preserving produce in a wholesome condition for an extended period of time which comprises a sealed container enveloping the produce, filled with a preservative gas which inhibits bacterial growth, and formed by a high barrier film which is so perforated as to provide a gas pressure within the container sufficient to inhibit air inflow into the container and to assure gas outflow from the container to prevent its distortion.

4,515,267

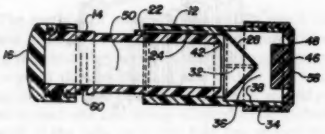
DENTAL MIXING AND EXTRUSION CAPSULE

Richard E. Welsh, Milford, Del., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Nov. 16, 1983, Ser. No. 553,250
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—219 **7 Claims**

1. A combination dental mixing and extrusion capsule including a pair of slidably telescoping sleeves, initially in partial telescopic relationship, the outer sleeve having a frangible

diaphragm intermediately of its ends and a closure on one end having an integral frangible piston-like section and defining with said diaphragm a compartment for a first ingredient, the inner sleeve having a removable closure at the outer end defining with said frangible diaphragm of the outer sleeve another compartment for a second ingredient, the inner sleeve being movable telescopically inward to cause the inner end thereof to fracture the diaphragm and cause intermingling of the first and second ingredients to effect mixing thereof when the capsule is vibrated, and a nozzle optionally exchangeable for the



removable closure on the inner sleeve to permit discharge of mixed material therethrough when said frangible piston-like section of the closure on the outer sleeve is severed by a plunger and is moved inward piston-like against the mixed material in the compartment of the inner sleeve, said frangible piston-like section having a diameter complementary to the inner diameter of said inner sleeve and also has a rim portion connected to the closure on the outer sleeve by a weakened integral configuration readily fractured when said piston-like section is engaged by an external plunger of a dispensing gun or the like and is moved against said piston-like section.

4,515,268

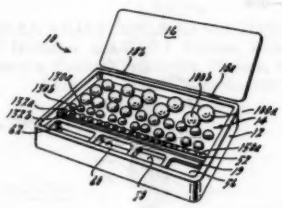
BALL CASE FOR STORING AND ORGANIZING GAGE BALLS

Reginald O. Telly, 40002 Tothill, Sterling Hgts., Mich. 48078

Filed Aug. 22, 1983, Ser. No. 525,304

Int. Cl.³ B65D *85/38*

U.S. Cl. 206—305 **23 Claims**



1. A ball case for storing and organizing gage balls of a plurality of predetermined sizes, said ball case comprising:

a housing;

a base member for said housing, said base member having an upper surface including at least a first sloping surface; and

a plurality of partial spherical cavities formed in said base member below said first sloping surface, each of said cavities having predetermined portions for engaging one of said gage balls and predetermined depths such that said gage balls, when engaged in their respective cavities, extend upwardly therefrom to together define a single predetermined horizontal planar surface thereabove tangential to each of said gage balls.

4,515,269

MAGAZINE FOR ELECTRONIC DEVICES

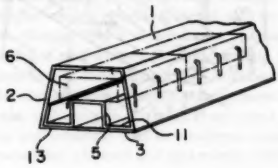
Tadashi Hashimoto, Nagahama, Japan, assignor to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 452,898

Claims priority, application Japan, Dec. 29, 1981, 56-198679; Aug. 4, 1982, 57-118439; Aug. 4, 1982, 57-118440; Sep. 24, 1982, 57-144540

Int. Cl.³ B65D *85/30*

U.S. Cl. 206—334 **16 Claims**



1. A tubular magazine for containing one or more electronic devices, said tubular magazine:

(a) having a uniform quadrilateral cross-section along its axial length;

(b) said uniform quadrilateral cross-section being defined by a bottom wall, two side walls, and a top wall;

(c) all four of said walls being formed from a single continuous, thin, transparent, flexible, quadrilateral, plastic sheet;

(d) a stand to support one or more electronic devices thereon being formed on said bottom wall along a lengthwise portion thereof;

(e) one end of said sheet overlapping the opposite end of said sheet;

(f) said stand being formed from the inward one of said one end of said sheet and said opposite end of said sheet, said inward one of said one end of said sheet and said opposite end of said sheet making planar engagement with the outward one of said one end of said sheet and said opposite end of said sheet over a first longitudinal strip of said bottom wall and being spaced therefrom to define said stand over a second longitudinal strip of said bottom wall adjacent to said first longitudinal strip of said bottom wall; and

(g) said one end of said sheet overlapping and being laminated to said opposite end of said sheet over the entire surface of said bottom wall except for said second longitudinal strip of said bottom wall, thereby giving said tubular magazine a resistance to deflection or twisting which it would not have without the overlap.

4,515,270

SURGICAL GLOVE CARTON AND TRASH RECEPTACLE

Alfredo Alvarado, 1974 Heritage Rd., Huntingdon Valley, Pa. 19006

Filed Mar. 15, 1984, Ser. No. 589,827

Int. Cl.³ B65D *45/06*

U.S. Cl. 206—438 **4 Claims**

1. A collapsible carton for containing a pair of sterilized surgical gloves comprising:

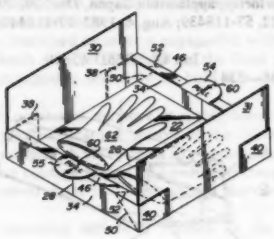
(a) a generally rectangular floor, said floor being formed by a pair of opposing main body panels joined by a center fold line bisecting said floor, each main body panel restingly supporting a surgical glove;

(b) a pair of generally rectangular side flaps foldably connected to opposite edges of the floor by side flap fold lines perpendicular to said center fold line, said side flaps bisected by a continuation of the center fold line and being collapsible into the floor;

(c) a pair of generally rectangular end flaps foldably connected to opposite lateral edges of the body panels by end flap fold lines parallel to the center fold line, said end flaps being collapsible into the floor and said side flaps, said end

flaps and side flaps being foldably connected at their edges to form a four-sided collapsible enclosure around said floor;

(d) a generally rectangular cuff foldably connected to the lateral edge of each side flap, said cuff being bisected by an



extension of the center fold line and folded over 90° such that it lies in a plane parallel to the carton floor; and

(e) a pull tab affixed by adhesive means to each cuff for grasping, said pull tab being disposed outwardly from the carton in a plane parallel to the floor.

4,515,271

INSERT MEANS FOR FORMING VOIDS IN CONCRETE AND METHOD OF APPLYING SAME

Michael J. Auciello, Haverhill, and Anthony R. Auciello, Scituate, both of Mass., assignors to Auciello Iron Works, Inc., Hudson, Mass.

Continuation-in-part of Ser. No. 420,547, Sep. 20, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 552,627

Int. Cl.³ B65D *85/62, 21/02;* **B28B** *7/28*

U.S. Cl. 206—519 **6 Claims**

1. Insert means for use in forming voids in poured concrete comprising a tubular body of sheet material insertable in poured concrete while the concrete is in a plastic state, upper and lower closure elements detachably secured in top and bottom portions of the tubular body, the inner surface of the tubular body being formed with a helical line of scoring extending between the upper and lower closure elements, said upper closure element being formed integrally with the tubular sheet material and constructed at an upper side thereof with upperwardly extending holder tab means for lifting the upper closure element and also pulling away the tubular structure along the said line of scoring to leave a void in hardened concrete.

4,515,272

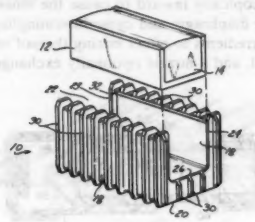
ROSIN BAR HOLDER

Denis P. Newhouse, 18439 Algonac, Detroit, Mich. 48234

Filed Mar. 29, 1983, Ser. No. 480,100

Int. Cl.³ B65D *81/02, 85/00*

U.S. Cl. 206—592 **6 Claims**



1. A rosin bar holder comprising:

a body having sidewalls, end walls, a bottom and an open top defining an internal cavity for removably receiving a rosin bar, the internal cavity having a shape complementary to the shape of the rosin bar;

inwardly extending lips formed at the upper ends of the sidewalls overlaying the internal cavity in the body to secure a rosin bar therein; and

aligned aperture means formed in the end walls of the body and extending from the open top for enabling an article to be used for its intended purpose while being housed in the body, said aperture being of less width and height than the internal cavity to further secure a rosin bar therein; and

the body being formed of a shock absorbing and resilient material for protecting the rosin bar housed here in from damage from external forces and to enable the sidewalls to be resiliently urged outward for removable insertion of a rosin bar into the body.

4,515,273

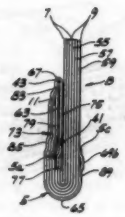
BAG WITH TAB AND METHOD OF FORMING

Roger K. Jacobson, Ramsey, and Ronald W. Munson, Minneapolis, both of Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed Mar. 30, 1983, Ser. No. 480,573

Int. Cl.³ B65D *33/00*

U.S. Cl. 206—604 **13 Claims**



1. A bag having a pinch closure at one end and a tab for opening it at said end, the bag being formed from a bag tube having first and second walls, the second wall having an extension beyond the first at said end, the closure comprising a flap constituted by an end portion of the tube at said end folded over on a fold line spaced inwardly from the end edge of the first wall at said end, said flap thereby comprising the end portion of the first wall from said fold line to said end edge of the first wall, a portion of the second wall coextensive with said end portion of the first wall and said extension of the second wall, the tab having an inner end portion between said

portions of the walls, an intermediate portion underneath said extension, and an outer portion projecting out from under said extension, said flap being adhered to the outside face of the first wall, the intermediate portion of the tab being adhered to the outside face of the first wall, characterized in that the outer portion of the tab has a first part folded over on a fold line adjacent the end edge of the second wall at said end of the bag overlying said flap and a second part folded over on a fold line generally coincident with the first-mentioned fold line and overlying the second wall of the bag, said second part being releasably adhered to said second wall of the bag and having a free portion enabling it to be grasped and pulled to tear the bag open.

9. The method of making a bag with a pinch closure at one end and a tab for opening it at the closure from a bag tube having first and second walls with an extension of the second wall beyond the first at said one end of the tube, each wall having an inside face and an outside face, an end portion of the tube at its said one end being adapted to be folded over on the first wall of the tube on a first fold line spaced inwardly from the end edge of said first wall at said one end of the tube to form a closure flap, said method comprising:

applying a tab to the tube at its said one end with part of the tab on the portion of the inside face of the second wall included in said extension and an outer part of the tab extending out beyond the end edge of said extension a distance greater than the spacing of said first fold line from the end edge of said extension, and adhering the tab to said extension;

folding said outer part of the tab over on a second fold line adjacent said end edge of the extension to overlie the outside face of said second wall, and releasably adhering said outer part of the tab to the outside face of said second wall with the outer end of the tab adapted to be grasped and pulled away from the second wall; and

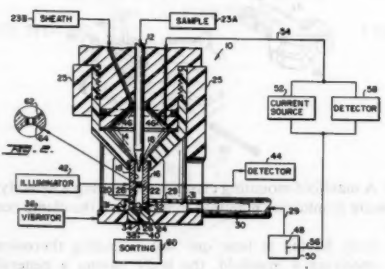
folding said closure flap over on said first fold line to overlie said first wall of the tube and adhering it thereto to form a pinch closure at said one end of the tube, that part of the tab between said first and second fold lines folding over with the flap and being adhered along with the flap to said first wall, said outer part of the tab being folded on said first fold line as the flap is folded over and ending up with a portion on the outside of the flap and a portion on the outside of the second wall releasably adhered to the second wall and adapted to be torn away from the second wall and pulled to tear the bag open at the closure.

4,515,274

PARTICLE ANALYZING AND SORTING APPARATUS

John D. Hollinger, and Raul I. Pedroso, both of Miami, Fla., assignors to Coulter Corporation, Hialeah, Fla.

Filed Dec. 2, 1981, Ser. No. 326,734
Int. Cl.³ B07C 5/02
U.S. Cl. 209—3.1 **8 Claims**



1. A particle analyzing and sorting apparatus for studying particles in suspension, said apparatus including a flow cell having a particle sensing aperture through which a stream of said particles in suspension is passed, means for passing an electric current through said sensing aperture simultaneously with passage of a particle through said sensing aperture, first detecting means responsive to electrical impedance variations for generating a particle pulse signal with the passage of said particle through said aperture, illumination means for providing radiation to illuminate said particle in said particle sensing aperture, second detecting means responsive to optical effects caused by the passage of said particle through said radiation for generating an analog electrical signal, said flow cell having an upstream channel and a downstream channel formed in opposed ends of said flow cell, said particle sensing aperture being disposed in fluid connecting relationship between said channels, said apparatus being further characterized by:

a nozzle, including an exit orifice, mounted at the end of said flow cell adjacent said downstream channel so that said downstream channel and said nozzle defines a flow chamber;

means for introducing a sheath liquid into said flow chamber, proximate said exit orifice and proximate to the downstream end of the downstream channel, to hydrodynamically focus said stream of particles as said stream proceeds from said particle sensing aperture to said exit orifice and for jetting said stream in a liquid jet from said nozzle;

means for periodically disturbing said liquid jet to produce droplets containing said particles; and

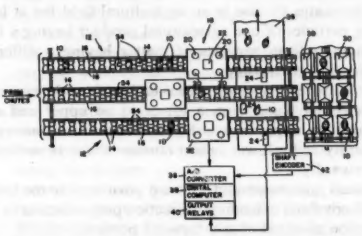
means for sorting said droplets based on said signals.

4,515,275

APPARATUS AND METHOD FOR PROCESSING FRUIT AND THE LIKE

George A. Mills, and Gerald R. Richert, both of Three Rivers, Calif., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 30, 1982, Ser. No. 430,068
Int. Cl.³ B07C 5/10, 5/342
U.S. Cl. 209—558 **35 Claims**



1. Apparatus for processing items such as fruit and the like; comprising:

video signal means for examining an item and developing a plurality of discrete data signals, each said data signal being representative of a condition of a respective portion of said item;

storage means for storing said data signals as they are generated, thereby generating a stored batch of item data corresponding to said item;

batch processing means for processing said batch of data to generate one or more batch reference signals representative of the batch of item data, and process signal generation means for generating at least one process signal by processing at least some of the data of said batch as a function of said one or more batch reference signals; and

means for processing said item as a function of said one or more process signals.

4,515,276

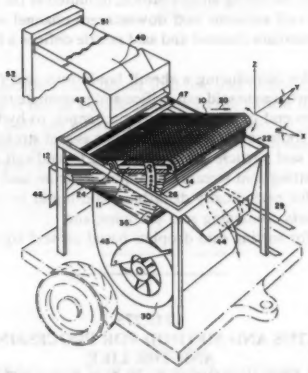
SEPARATION DEVICES EMPLOYING FORCED AIR THROUGH CONVEYOR BELT MEANS

Ron Feller, Ramat Efal, and Amos Mizrach, Holon, both of Israel, assignors to The State of Israel, Ministry of Agriculture, Jerusalem, Israel

Continuation-in-part of Ser. No. 278,392, Jun. 29, 1981, abandoned. This application Jul. 20, 1983, Ser. No. 515,684

Int. Cl.³ B07B 3/08

U.S. Cl. 209—693 17 Claims



1. An apparatus for use in an agricultural field for at least separating particles of one agricultural product having a first specific density from particles of matter having a different specific density, comprising:

moveable endless conveyor means inclinable with respect to a horizontal plane from a lower to an upper end and defining an upper forward portion which is moveable upwardly and a lower return portion which is moveable downwardly,

gate means juxtaposed said forward portion near the lower end thereof and extending a direction perpendicular to the direction of travel of said forward portion;

an air directing housing means below said conveyor means defining an opening of adjustable dimensions including air suction means for sucking into said housing means through said opening field air with any contaminants therein and for directing said contaminated air toward the conveyor means through a top opening of housing means, whereby the air passes through the return portion to the forward portion of said conveyor means to cause said particles thereon to be stratified with the particles of higher specific density being closest to said forward portion and travelling upwardly with it toward the upper end and the particles of lower density being stratified above the heavier particles and sliding downwardly toward said gate means, while contaminants in the air are blocked by said return portion from passing to said forward portion and are carried downwardly beyond the top opening of said housing means.

4,515,277

HOLDER WITH A PLURALITY OF SPRING CLIPS FOR SUSPENSION OF SHEET MATERIAL

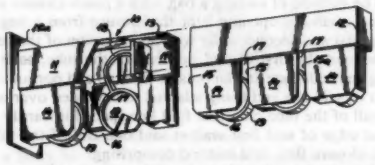
Thomas Leth-Sorensen, Gabelsparken 259, DK-6740 Bramming, Denmark

PCT No. PCT/DK82/00076, § 371 Date Apr. 4, 1983, § 102(e) Date Apr. 4, 1983, PCT Pub. No. WO83/00423, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 11, 1982, Ser. No. 486,957

Int. Cl.³ A47F 5/08

U.S. Cl. 211—45 4 Claims



1. A holder for suspension of sheet material, comprising an elongated support member formed integrally with a plurality of spaced apart, downwardly projecting spring members each of which carries at its free end a clamping disc, a box-shaped case member having a bottom portion and a pair of side walls, said box-shaped case member being connectable to the support member and having a plurality of compartments with partitions therebetween for receiving respective clamping discs, each partition having an abutment against which the clamping disc in an adjacent compartment is positioned, and said box-shaped case member having openings in its bottom portion through which a portion of respective clamping discs extend and slots formed in its side walls for receiving the sheet material to be suspended.

4,515,278

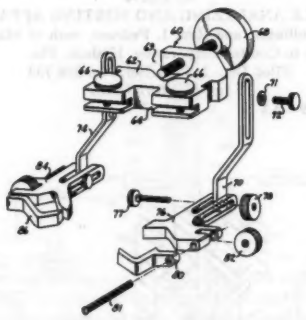
MANIFOLD FOR MONITORING HEMODYNAMIC PRESSURE

William A. DeVroom, Glendora, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 310,016, Oct. 13, 1981,. This application Nov. 14, 1983, Ser. No. 551,661

Int. Cl.³ A47F 5/00

U.S. Cl. 211—107 3 Claims



1. A manifold mounting clamp for mounting a hemodynamic pressure monitoring manifold to a support, the clamp comprising:

a body having at least one slot extending therealong for receiving a manifold, the body having a generally U-shaped configuration for receiving a support to which the manifold is clamped;

a threaded knob assembly extending through the body and

cooperating with the U-shaped configuration to provide means for securing the clamp to a support;

fastening means on the body, cooperating with the slot for securing a manifold positioned within such slot to the body;

a pair of arms releasably fastened to the body and extending therefrom;

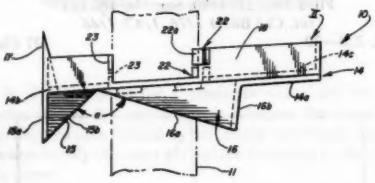
transducer support means releasably attached to each of the arms for releasably supporting a pair of transducers to the body.

4,515,279

DISPLAY SHELF CONSTRUCTION

Homer F. King, Elmhurst, Ill., assignor to H. King & Associates, Ltd., Elmhurst, Ill.

Filed Aug. 2, 1982, Ser. No. 404,016
Int. Cl.³ A47F *5/16*
U.S. Cl. 211—153 **14 Claims**



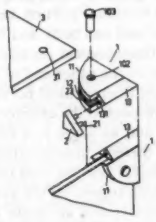
1. A removable display shelf adapted to be selectively mounted in either of two modes between at least a pair of spaced, substantially parallel, upright supports, said shelf comprising a panel section for disposition intermediate the upright supports and projecting outwardly therefrom when said shelf is in either mode; an end section disposed at a peripheral segment of the panel section and adapted to engage a supporting member disposed rearwardly of the upright supports when said shelf is mounted in either mode on the upright supports; an angularly and rearwardly extending first ramp section mounted on one surface of said panel section; an angularly and forwardly extending second ramp section mounted on said panel section one surface forwardly of said first ramp section, said first and second ramp sections, when said shelf is in a first mode, coacting to supportingly engage an article in an upwardly tilted position relative to the panel section one surface; and support-engaging means extending outwardly from and spaced from said end section and coacting therewith for retaining said shelf in either mode between the upright supports.

4,515,280

COUPLING DEVICE

Roung-Hwang Sheu, No. 18, Lane 191, Sec. 1, Nan-Ko Rd., Changhua City, Taiwan

Filed May 31, 1984, Ser. No. 615,904
Int. Cl.³ F16B *5/06*
U.S. Cl. 211—189 **1 Claim**



1. In a display case of the type having a plurality of rectangular boards coupled to one another to define compartments, a device for coupling boards comprising:

a flat member having two adjacent first sides forming a right angle, a second side opposite to the right angle having a groove for receiving one corner of the board, two projecting portions extending outwards from said first sides respectively, each of said projecting portions having isosceles right-angled triangle shaped cross-section with a hypotenuse contiguous to said first side; and

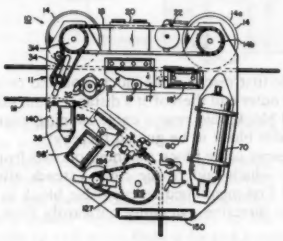
means for connecting each said projecting portion to the projecting portion of another coupling device when said projecting portions are in side by side adjacent relationship.

4,515,281

RADIO-CONTROLLED SKYLINE CARRIAGE

William Maki, Star Rte. 60, Pierce, Id. 83546

Filed Jul. 21, 1982, Ser. No. 400,761
Int. Cl.³ B66C *21/00*
U.S. Cl. 212—76 **7 Claims**



1. A carriage for moving along a suspended skyline, which comprises:

a body;

a pair of skyline wheels rotatably mounted on the body, the skyline wheels rollably suspending the carriage from the skyline when the skyline wheels are placed on the skyline;

means for receiving remotely transmitted signals;

a hydraulically actuated carriage component activated by the receiving means; and

a hydraulic system for supplying hydraulic pressure to the carriage component, the hydraulic system including:

a reservoir containing hydraulic fluid;

a first hydraulic pump for pressurizing fluid from the reservoir, the first pump having an impeller coupled to a skyline wheels for rotation when the carriage is moving uphill along the skyline;

a second hydraulic pump for pressurizing fluid from the reservoir, the second pump smaller than the first pump, the second pump having an impeller coupled to a skyline wheel for rotation when the carriage is moving downhill along the skyline; and

an accumulator for storing pressurized hydraulic fluid.

4,515,282

ROTATABLE CRANE APPARATUS FOR A RESCUE VEHICLE

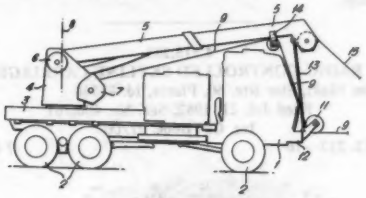
Sverre Falch, Moelv, Norway, assignor to A/S Moelven Brug, Moelv, Norway

Continuation of Ser. No. 332,834, Dec. 21, 1981, abandoned. This application Jun. 26, 1984, Ser. No. 625,172
Claims priority, application Norway, Mar. 9, 1981, 810792
Int. Cl.³ B66C *23/26;* B60D *3/12*
U.S. Cl. 212—254 **1 Claim**

1. A rescue vehicle having a wheeled frame, a front bumper attached to said frame, a crane apparatus including a crane turret mounted on said frame for rotation about a vertical axis,

a crane boom having an inner and an outer end with the inner end mounted on said crane turret, a block mounted on said outer end, a hoist winch means for providing vertical pulling power mounted on said turret adjacent the inner end of the boom and a hoist cable wound thereon running substantially along said boom and over said block; a rescue winch means for providing horizontal pulling power and having 10–20 times greater power than said hoist winch means mounted on said turret adjacent to and substantially below said inner end of said boom;

a rescue cable operatively wound on said rescue winch means and extending therefrom beneath said boom in the general direction toward said block;



a detachable first rescue cable block mounted on said boom near said outer end thereof at a distance from said axis less than said block; said rescue cable running over said first rescue cable block to be guided thereby;

a second rescue cable block mounted on said front bumper and over which said rescue cable extends after passing over said first-mentioned rescue cable block in a general horizontal direction extending outwardly from the vehicle; and

a Y-shaped stay bar means mounted on said second rescue cable block for engaging said boom near the outer end thereof and to support said boom.

4,515,283

BUNG FOR JARS

Hiro Suzuki, 109 Wicks Rd., North Ryde, N.S.W. 2113, Australia

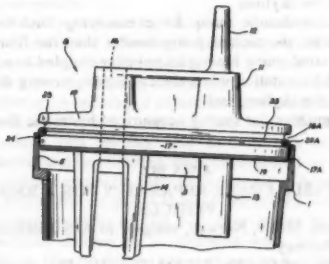
PCT No. PCT/AU82/00188, § 371 Date Jul. 12, 1983, § 102(e) Date Jul. 12, 1983, PCT Pub. No. WO83/01767, PCT Pub. Date May 26, 1983

PCT Filed Nov. 15, 1982, Ser. No. 519,771

Claims priority, application Australia, Nov. 13, 1981, PF1551; Jun. 2, 1982, PF4250

Int. Cl.³ A61M *1/00*

U.S. Cl. 215—270 **6 Claims**



1. An aspirator apparatus comprising a collection jar having an open mouth and an internal shoulder joined to the mouth by a wall portion, and a bung closing said mouth and being moulded in shell-form from thermoplastic material, said bung comprising an outwardly domed top, a peripheral skirt depending from said top and being within said mouth and closely adjacent said wall portion, a circumferential recess in the outer face of said skirt, and a resilient O-ring accommodated within said recess and bearing against said wall portion to provide a primary seal between said jar and said bung, said apparatus includes the thermoplastic material of said bung being resilient to permit said domed top to depress inwardly with sub-atmospheric pressure within said jar to cause said skirt to press said O-ring and an inner end of said skirt against said wall portion to increase the sealing pressure between the jar and the bung.

4,515,284

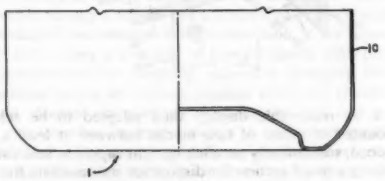
CAN BODY BOTTOM CONFIGURATION

Harry W. Lee, Jr., and Joseph W. Wallace, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 21, 1980, Ser. No. 180,121

Int. Cl.³ B65D *1/16, 1/42, 1/46*

U.S. Cl. 220—70 **27 Claims**



1. In a metallic can body comprising a sidewall and a bottom closing structure, the improvement wherein said bottom closing structure comprises a first semi-torroidal portion having one end thereof directly attached to said sidewall, said first semi-torroidal portion being convex with respect to the exterior of said can body and having a radius r_1 and an angle α; a second semi-torroidal portion having one end thereof directly attached to the other end of said first semi-torroidal portion, said second semi-torroidal portion being convex with respect to the exterior of said can body and having a radius r_2 and an angle β, r_2 being greater than r_1; a third semi-torroidal portion having one end thereof directly attached to the other end of said second semi-torroidal portion, said third semi-torroidal portion being convex with respect to the exterior of said can body and having a radius r_3 and an angle μ, r_3 being less than r_2; a ring portion upon which said can body rests having one end thereof directly attached to the other end of said third semi-torroidal portion, said ring portion having a length L_1, said length L_1 ranging between about 0.020 to 0.175 inches (0.051 to 0.445 centimeters), and said ring portion being radially inwardly directed with respect to the exterior of said can body at an angle ν; a fourth semi-torroidal portion having one end thereof directly attached to the other end of said ring portion, said forth semi-torroidal portion being convex with respect to the exterior of said can body and having a radius r_4 and an angle γ; a first frustoconical portion having one end thereof directly attached to the other end of said fourth semi-torroidal portion, said first frustoconical portion being radially inwardly directed with respect to the exterior of said can body and having a length L_2 and an angle ρ; a fifth semi-torroidal portion having one end thereof directly attached to the other end of said first frustoconical portion, said fifth semi-torroidal portion being concave with respect to the exterior of said can body and having a radius r_5 and an angle λ; and a bottom closing portion directly attached to the other end of said fifth semi-torroidal portion.

4,515,285

VALVE PLATES FOR CONTAINER VALVES AND METHOD OF MANUFACTURING SAME

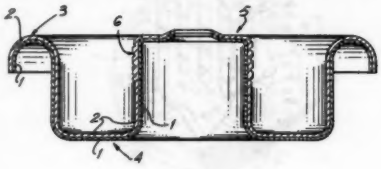
Werner Euscher-Klingenhagen, Bielefeld; Horst Griemla, Steinhagen, and Hartmut Rodekamp, Bielefeld, all of Fed. Rep. of Germany, assignors to Ewald Euscher, Bielefeld, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 609,034

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317809

Int. Cl.³ B21D *39/00*; B65D *51/20*

U.S. Cl. 220—288 6 Claims



1. In a valve plate for a container valve and having a threaded dome, the improvement wherein the valve plate comprises two plies formed by deforming two blanks together, and wherein only the outer ply has the threading in the vicinity of the dome.

4,515,286

CAP AND A CAP OPENING AND CLOSING DEVICE

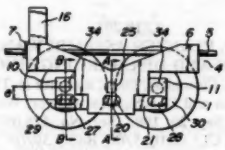
Masao Ushikubo, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Dec. 19, 1983, Ser. No. 563,070

Claims priority, application Japan, Dec. 22, 1982, 57-194699[U]; Dec. 22, 1982, 57-194700[U]

Int. Cl.³ B65D *45/28*

U.S. Cl. 220—314 12 Claims



1. A cap for sealing airtightly an opening of a liquid container to prevent evaporation of a liquid contained therein, comprising a plurality of projections formed in a bottom surface of the cap which is to be urged against a upper surface of a mouthpiece defining the opening of a liquid container, said projections comprising an elastic material such that said projections are elastically deformable to airtightly seal said opening and such that a force employed to so elastically deform said projections can be substantially recovered to aid in breaking said seal when said cap is removed from said mouthpiece.

4,515,287

PRESSURE ACTIVATED CLOSURE LOCK

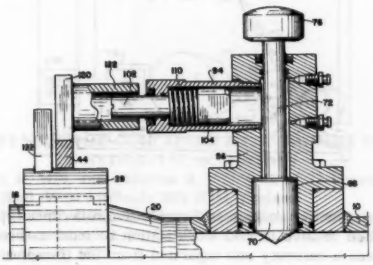
Richard Baudoux, Nivelles, Belgium, and Anthony J. Webb, Wiltshire, England, assignors to T.D. Williamson, Inc., Tulsa, Okla.

PCT No. PCT/US82/01341, § 371 Date Apr. 27, 1984, § 102(e) Date Apr. 27, 1984, PCT Pub. No. WO84/01354, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 28, 1982, Ser. No. 619,166

Int. Cl.³ B65D *45/00*

U.S. Cl. 220—316 8 Claims



1. Safety apparatus for use to close an opening in a pressure containment vessel comprising:

a door sealably engageable with an opening in a pressure containment vessel, the door being pivotally supported to move to and away from a closed position;

a handle pivotally supported relative to the opening and moveable to and away from a locked position in which said door seals the opening;

a pressure lock housing affixed to and extending from the pressure containment vessel, the housing having a cylindrical opening therein the axis of which intersects the plane of pivotation of said handle, a fluid communication channel connecting the cylindrical opening with the interior of the vessel;

a piston member reciprocally received in said cylindrical opening and having a portion extending sealably exteriorly of said housing;

means of biasing said piston inwardly; and

means carried by said handle engageable by said piston whereby when the handle is in said locked position such means is engaged by said piston member when the pressure within said vessel is above a preselected level and said handle can be moved from the locked position only when the pressure in the vessel is below the preselected level.

4,515,288

CURRENCY-DISPENSING METHOD AND APPARATUS

Martin M. Atalla, Atherton, Calif., assignor to Atalla Corporation, San Jose, Calif.

Filed Dec. 1, 1982, Ser. No. 446,074

Int. Cl.³ B65H *5/28*

U.S. Cl. 221—1 9 Claims

1. Currency-dispensing apparatus comprising:

a transport medium;

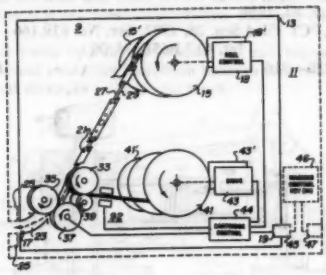
a supply of currency units adhesively attached to said transport medium in substantially coplanar relationship therewith at successive locations therealong, with each adhesive attachment of a currency unit being disposed at at least one isolated, discontinuous region that is spaced inwardly from a forward edge of the currency unit;

a work station for altering the coplanar relationship of the transport medium and currency attached thereto for separating the forward edge of a currency unit from said transport medium in advance of encountering said region of adhesive attachment therealong;

motive drive control means for selectively advancing the

transport medium through the work station in response to applied electrical control signals to separate the currency unit from the transport medium at said region of adhesive attachment; and

detector means including conductive roller means disposed



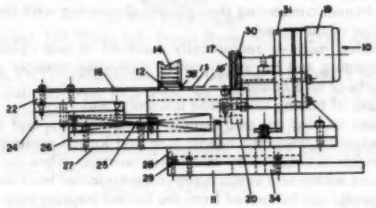
in conductive contact, said conductive roller means positioned relative to said work station to receive therebetween a currency unit separated from the transport medium to produce in response thereto a detector signal which is indicative of a currency unit being separated from the transport medium.

4,515,289

HOPPER FEED MECHANISM FOR RADIAL LEAD DEVICES

Merlin Lawrence, Fairview, Pa., assignor to Automated Industrial Systems, Erie, Pa.

Filed Sep. 30, 1982, Ser. No. 431,036
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—13 **16 Claims**



12. A mechanism used to feed articles into other process equipment, comprising,

a frame having a track,

a feedwheel and an idler wheel rotatably supported on said frame to rotate about axes generally perpendicular to said track,

means to mount said frame on said process equipment,

a hopper for a stack of said articles,

means on said mechanism to move said drive wheel and said feedwheel to a position spaced from each other,

a shuttle blade adapted to successively push the lower most of said articles out of said hopper and axially of said wheels and between said idler wheel and said feedwheel when said idler wheel and said feedwheel are moved to spaced position from one another,

means to power said shuttle blade and means for movably supporting said shuttle blade on said frame,

a means to detect interruptions of feed of said articles,

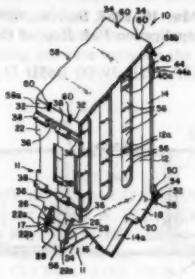
and means in contact with said means to power said shuttle blade, to stop feeding process and to reverse said shuttle blade.

4,515,290

ARTICLE DISPENSING APPARATUS

Jay Fishler, 39 Artisan Ave., Huntington, N.Y. 11743

Filed Jun. 6, 1983, Ser. No. 501,263
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—124 **12 Claims**



1. A dispenser for articles comprising a plurality of planar partition means,

means for joining said plurality of partition means in spaced side-by-side ganged array whereby when joined, the space between adjacent ones of said partition means defines a column to store in stackable array the articles to be dispensed therefrom,

each of said partition means being formed with an extension so that when said partition means are joined adjacent extensions provide an area into which the articles to be dispensed are loaded and also hold the last-to-be-loaded article in display and dispensing positions,

means in each column applying a pressure to the articles loaded into the column so that the last-to-be-loaded article is held in the display position for partial ejection therefrom under the application of said pressure applying means and for manual removal and dispensing from the column,

said pressure applying means operating to cause the selected article to eject from the display position to the dispensing position when moved slightly relatively thereto,

said means for joining said partition means together being releasable and being complementary positioned on adjacent partitions to engage with each other such that when adjacent partitions are placed side by side said joining means engage to lock the same together and release their engagement to enable separation of the partitions upon the application of a separating force to the partitions.

4,515,291

SEED PLANTER, PLANTER ASSEMBLY AND METHOD OF PICKING UP AND DISCHARGING SINGLE SEEDS

Robert G. Holmes, Columbus, Ohio, assignor to The Ohio Agricultural Research and Development Center, Wooster, Ohio

Filed Sep. 29, 1982, Ser. No. 428,097
Int. Cl.³ A01C *5/00*; B65G *59/04*
U.S. Cl. 221—211 **12 Claims**

1. A seed planter comprising:

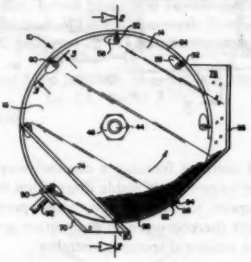
a seed transport member having a surface in the form of a wall, means forming at least one depression therein, said depression means being able to accommodate a seed, the deepest portion of said depression means forming a tapering seed retaining section having its narrowest cross-section at its deepest part, said retaining section having the form of a solid of revolution having an axis, said axis being at an angle not perpendicular to said wall surface, said depression means also defining a ramp surface sloping downwardly from the wall surface into said seed retaining section, a gas supply conduit means in fluid communica-

tion with said seed retaining section of said depression adjacent the deepest part thereof;

a seed loading station;

a seed unloading station;

drive means for moving said depression means past said seed loading station such that said ramp surface passes said seed loading station ahead of said seed retaining section, and for thereafter moving said depression past said seed unloading station;



gas supply means for passing a stream of gas through said gas supply conduit means into said depression as said depression passes said seed loading station; and

pressurizing means for increasing the pressure within the narrowest part of said seed retaining section after said depression has passed said seed loading station but not later than the time at which said depression passes said seed unloading station.

4,515,292

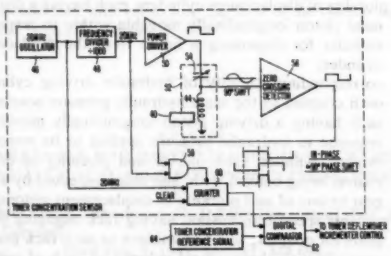
DIGITAL IMPLEMENTATION OF TONER CONCENTRATION SENSING APPARATUS

William M. Koos, Jr., Orlando, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 19, 1983, Ser. No. 496,156

Int. Cl.³ B67D *5/14*

U.S. Cl. 222—52 **20 Claims**



1. An apparatus for monitoring the concentration of toner in a toner system, said apparatus comprising:

means for holding a supply of said toner system, said toner system including a mixture of toner particles and ferromagnetic carrier beads;

a resonant circuit tuned to a fixed predetermined frequency, said resonant circuit including a sensor coil surrounding a portion of said holding means;

means for exciting said resonant circuit with a first signal, said first signal's frequency being said fixed predetermined frequency; and

logic circuit means, responsive to a second signal from said exciting means, said second signal's frequency also being said fixed predetermined frequency, said logic circuit means further being responsive to an output from said resonant circuit, said logic circuit means for generating at its output a signal representative of a phase shift between said second signal and the output from said resonant circuit, the amount of said phase shift indicative of the actual concentration of the toner in said toner system.

4,515,293

DISPENSER FOR COLLAPSIBLE CONTAINERS WITH HYDRAULIC ACTUATION

Henry R. Hill, and Christine R. Hill, both of 72 Homer Rd., Solihull, West Midlands B91 3QH, England

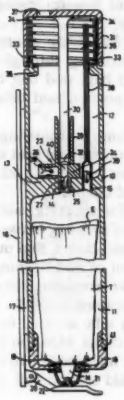
PCT No. PCT/GB82/00154, § 371 Date Jan. 26, 1983, § 102(e) Date Jan. 26, 1983, PCT Pub. No. WO82/04238, PCT Pub. Date Dec. 9, 1982

PCT Filed May 28, 1982, Ser. No. 464,502

Claims priority, application United Kingdom, May 30, 1981, 8116595

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—95 **14 Claims**



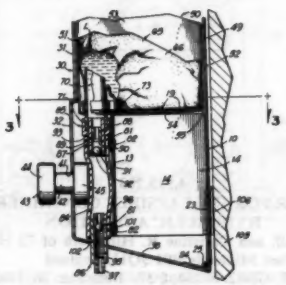
1. A dispenser having a housing adapted to hold a deformable container which contains an extrudable material and has a nozzle through which said material can be discharged by squeezing the container, the dispenser being operable to squeeze the container to discharge a predetermined amount of material wherein the housing is elongate and has a longitudinal axis and defines first and second chambers which are disposed longitudinally adjacent to each other and are separated by adjacent end walls, the first chamber being arranged to receive the container and having an opening at the end thereof distant from the second chamber for discharge of the material from the nozzle of the container, the second chamber providing a reservoir for hydraulic fluid and there being a pump, comprising a piston slidable in a pump chamber, disposed in the housing and operable to pump hydraulic fluid from the second chamber into the first chamber, the pump being operable by a plunger slidably mounted on the housing, at the end thereof distant from the first chamber, for movement parallel to the longitudinal axis of the housing.

4,515,294

LIQUID DISPENSER, VALVE THEREFOR AND PROCESS OF PRODUCING THE VALVE

Raymond E. Udall, Atlanta, Ga., assignor to Southern Chemical Products Company, Macon, Ga.

Filed Mar. 31, 1982, Ser. No. 363,966
Int. Cl.³ B65D *35/56*
U.S. Cl. 222—105 **9 Claims**



1. A cartridge assembly for use within a liquid dispenser comprising:

(a) a box-like fiberboard housing having a hole in its bottom portion;

(b) a flexible bag within said housing; said bag having a corner and an opening provided at said corner;

(c) liquid within said bag for being dispensed from said cartridge assembly;

(d) a discharge tube having an intermediate portion and an inner portion protruding through said opening and received within said bag, said bag being gathered around said intermediate portion said tube having an outer end portion;

(e) a compression clamp surrounding a portion of the gathered portion of said bag and said intermediate portion of said tube, the outer portion of said gathered portion extending below said clamp;

(f) adhesive means for securing said outer portion of said gathered portion of said bag between the inner surface of said housing and said clamp, said outer end portion of said tube protruding out of said opening in said housing; and

(g) a ball check valve extending through a hole in a screw cap and communicating with the interior of said tube, a flexible dispensing tube secured to said ball check valve, and a second ball check valve on the end of said dispensing tube, said first mentioned ball check valve being normally open and said second ball check valve being normally closed.

4,515,295

EYE DROPPER WITH LIGHT SOURCE

Delford O. Dougherty, Shaker Heights, Ohio, assignor to St. Luke's Hospital, Cleveland, Ohio

Filed Sep. 6, 1983, Ser. No. 529,357
Int. Cl.³ A61M *1/00*
U.S. Cl. 222—113 **5 Claims**

1. In combination, an eye drop dispenser including a compressible plastic container for the drops to be dispensed and an elongated, small diameter tubular dispensing member communicating with said container and having a dispensing orifice spaced therefrom,

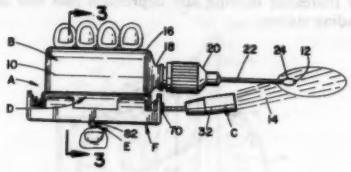
and a device for illuminating said dispensing orifice, said device comprising:

(a) a body member,

(b) a self-contained energy source carried by said body member,

(c) a light source mounted to said body member at a position located away from said dispensing orifice to provide an unobstructed area along a major portion of said tubular dispensing member, said light source being capable of projecting a collimated beam of light,

(d) a switch carried by said body member, said switch being operable to selectively connect said energy source to said light source, and



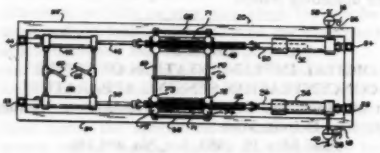
(e) aligned surfaces forming a channel-way receiving said container to provide a stable orientation of said container with respect to said device while permitting shifting movement therebetween in a direction generally aligned with said tubular dispensing member.

4,515,296

VARIABLE RATIO LIQUID METERING DISPENSER

Silverio B. Surdilla, 32400 Lois Way, Union City, Calif. 94587

Filed Sep. 23, 1982, Ser. No. 422,072
Int. Cl.³ G01F *11/06*
U.S. Cl. 222—134 **3 Claims**



1. A system for dispensing a plurality of liquids in predetermined ratios, said system comprising:

a plurality of displacement cylinders, each having a displacement piston longitudinally movable within its respective cylinder for dispensing a liquid from the displacement cylinder;

a corresponding plurality of hydraulic driving cylinders, each coupled to the same hydraulic pressure source and each having a driving piston longitudinally movable in response to hydraulic pressure applied to its respective driving cylinder, each one of said plurality of driving pistons being coaxial with, and interconnected by a rack gear to one of said plurality of displacement pistons; and

a variable speed transmission having rack engaging pinion gears for coupling said transmission to each rack gear for controlling the longitudinal velocity of each of said displacement pistons within its respective displacement cylinder upon the application of hydraulic pressure to said plurality of driving cylinders, said transmission including coarse change gears having a first meshing gear for meshing with a first one of said rack engaging pinion gears, and fine change gears having a second meshing gear for meshing with a second one of said rack engaging pinion gears, said coarse and fine change gears including, respectively, third and fourth pinion gears mounted for rotation upon a common rotatable splined shaft that interconnects said coarse and fine change gears, said first and second meshing gears in said coarse and fine change gears being disengaged from their repsective rack engaging pinion gears for gear ratio changes and reengaged thereto by first and second pneumatic cylinders having pistons coupled to

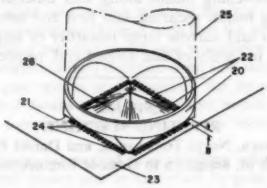
first and second pivotable arms supporting said first and second meshing gears.

4,515,297

METHODS FOR MULTIPOINT DISPENSING OF VISCOUS MATERIAL

David Schoenthaler, Lower Makefield Township, Bucks County, Pa., and Thaddeus Wojcik, Hopewell Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 26, 1983, Ser. No. 498,350
Int. Cl.³ B67D *5/64*
U.S. Cl. 222—160 **17 Claims**



1. A method for multipoint dispensing of viscous material onto a substrate, comprising the steps of:

positioning a viscous material dispenser, having a plurality of orifices, at a predetermined distance from the substrate surface;

during a first time interval, increasing the pressure within the dispenser to a predetermined value thereby forcing viscous material out of the dispenser orifices onto the substrate surface;

at the end of the first time interval, increasing the distance between the dispenser and the substrate at a substantially constant velocity while maintaining the dispensing pressure substantially at said predetermined value for a predetermined second time interval; and

removing the pressure within the dispenser at the end of the second time interval to stop the flow of the viscous material from the dispenser.

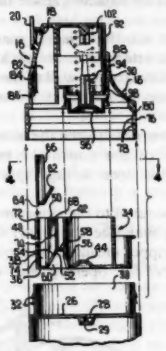
4,515,298

DISPENSER FOR PASTE-LIKE PRODUCTS WITH MANUALLY ACTUABLE PISTON INCLUDING INSERT DEVICE

Joachim Czech, Jahnstrasse 19, D-8405 Donaustauf, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,694
Int. Cl.³ G01F *11/02*
U.S. Cl. 222—380 **23 Claims**

1. An insert for mounting on a dispensing container beneath a separate head member, said insert comprising a base, walls extending from said base in a direction normal to said base and defining a pump chamber and a dispensing duct, said pump chamber and dispensing duct being open at their ends remote said base to permit a piston carried by said head member to be introduced into said pump chamber through its open end and to permit a discharge passage in said head member to be coupled to said dispensing duct, an outlet opening in said pump chamber and an inlet opening in said duct adjacent said base and in communication with each other for transferring a flowable product from said pump chamber to said duct, an inlet flow control valve carried by said insert for controlling product flow into said pump chamber from an opening in said container, and a back flow control valve in said duct for preventing back flow of a flowable product from said duct towards said pump chamber.



4,515,299

METHOD FOR HANDLING HOSIERY

James H. Sewell, Charlotte, N.C.; Hans Gaede, Fort Mill, S.C., and Curtis R. Ritch, High Point, N.C., assignors to Intech Corporation, Charlotte, N.C.

Division of Ser. No. 250,636, Apr. 3, 1981, Pat. No. 4,421,259.
This application Oct. 5, 1983, Ser. No. 539,297
Int. Cl.³ D06C *5/00*
U.S. Cl. 223—76 **20 Claims**

1. A method of handling hosiery comprising the steps of:

(a) placing a piece of hosiery on a form;

(b) moving a clamp mechanism upward along the length of the form until a portion of the clamp mechanism contacts and moves a bottom portion of the hosiery upward;

(c) closing clamp jaws of the clamp mechanism onto the bottom portion of the hosiery after performing step (b); and

(d) moving the closed clamp jaws, and the bottom of the hosiery held thereby, downward.

4,515,300

MULTIPLE-USE SPORTS BAG AND METHOD OF CONVERTING IT TO A BACKPACK

Carole Cohen, 6 Kingwood Dr., Poughkeepsie, N.Y. 12601

Filed Apr. 30, 1984, Ser. No. 605,390
Int. Cl.³ A45C *9/00*; A45F *3/04*
U.S. Cl. 224—151 **13 Claims**

1. A multiple-use sports bag comprising:

a pouch-like body having an exterior and an interior surface

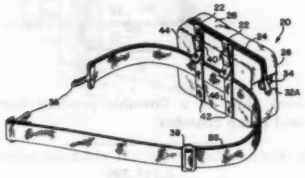
of six substantially rectangular walls, and also having an interior space being divided into a first open storage space on one side and an adjacent space next to a wall of the interior surface;

a backpack folded into the adjacent space;

a first strip means, attached to the backpack, and a second strip means, attached to the wall of the interior surface, for securing together the backpack folded into the adjacent space;

a zipper means, secured between the exterior surface and the interior surface of the pouch-like body, for providing access to the first open storage space and the adjacent space; and

a first tab means, secured to the zipper means on the exterior surface of the pouch-like body, and a second tab means, secured to the zipper means on the interior surface of the pouch-like body, for opening and closing the zipper means;



whereby, when the backpack is removed from the adjacent space, and unfolded into a use position, the pouch-like body is inverted so that the interior and exterior surfaces are reversed.

13. A method of converting a multiple-use sports bag to a backpack, comprising the steps of:

a. providing a pouch-like body with an exterior and an interior surface;

b. dividing the interior of the pouch-like body into a first open storage space and an adjacent space;

c. unzipping a first zipper secured between the exterior and the interior surface of the pouch-like body to provide an opening in the pouch-like body;

d. turning the pouch-like body inside out through the opening in the pouch-like body so that a backpack in a folded condition is accessible;

e. separating a first strip means from a second strip means in order to unsecure the backpack from a wall of the interior surface, now turned out of the pouch-like body; and

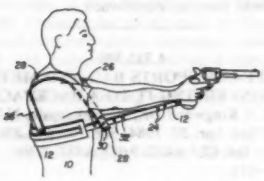
f. unfolding the backpack from the adjacent space.

4,515,301

HANDGUN ACCURACY CONTROL HARNESS

Anthony A'Costa, 2216 7th Ave., Apt. C 301, Pueblo, Colo. 81003

Filed Sep. 29, 1982, Ser. No. 426,341
Int. Cl.³ F41C *33/00*; A45F *5/00*
U.S. Cl. 224—204 **3 Claims**



1. A handgun accuracy control harness which comprises:

a wide, elongated, back strap, having right and left ends, in which said back strap extends linearly across a user's back,

a narrow strap secured to said back strap, and having a much greater length than said back strap,

said narrow strap including a loop on one end in which a handle of a handgun is to be placed during firing, and a non-looped end,

fastening means secured to said non-looped end of said narrow strap for securing said non-looped end of said narrow strap to said looped end of said strap inwardly of said loop,

a first shoulder strap secured at one end to said back strap inwardly of said right end and includes an unsecured end,

a second shoulder strap secured at one end to said back strap inwardly of said left end and includes an unsecured end,

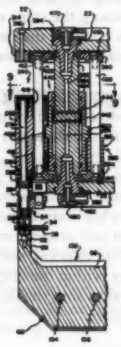
said first and second shoulder straps including equally spaced fastening means along said unsecured ends said fastening means securing said first and second shoulder straps to said narrow strap inwardly of said non-lopped end and inwardly of said looped end, respectively.

4,515,302

RIVETING MACHINE

John W. Davern, North Tonawanda, and Daniel D. Cook, Lancaster, both of, assignors to Gemcor Engineering Corp., Buffalo, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,824
Int. Cl.³ B21J *15/20, 15/30*
U.S. Cl. 227—58 **19 Claims**



1. In riveting apparatus comprising a frame having a main body portion and having a front end portion disposed in a first plane, means for defining a drilling and riveting axis in said frame closely adjacent and substantially parallel to said first plane, drilling means carried by said frame main body portion for drilling a rivet-receiving hole in the workpiece, and rivet inserting and forming means carried by said frame main body portion for inserting a rivet in the hole drilled in the workpiece and forming a head on the inserted rivet in co-operation with said holding and force applying means: means carried by said frame for holding a workpiece relative to said frame in a second plane substantially perpendicular to said first plane during drilling and riveting and for applying force for heading a rivet inserted in the workpiece, said holding means comprising a ram and clamp means movably carried by said frame main body portion and moved by motive means carried by said frame into and out of operative contact with one side of the workpiece, said ram and clamp means having a first section connected to said motive means, movably mounted in said frame main body portion and extending in a direction substantially parallel to said drilling and riveting axis, a second section extending from said first section at substantially a right angle thereto and toward said drilling and riveting axis, and a third section extending from said second section at substantially a

right angle thereto and toward said workpiece, said third section being located so as to be in positional alignment with said drilling and riveting axis and so as not to extend beyond said first plane through said frame front end portion.

2. In riveting apparatus comprising a frame, drilling means movably carried by said frame for drilling a rivet-receiving hole in a workpiece, and rivet inserting and forming means movably carried by said frame for inserting a rivet in the hole drilled in the workpiece and forming a head on the inserted rivet;

(a) a single fluid-operated motive means carried by said frame for selectively engaging and moving said drilling means and said rivet inserting and forming means toward and away from the workpiece;

(b) fluid circuit means for supplying fluid to operate said motive means;

(c) flow control means in said circuit for slowing the rate of fluid flow when said motive means is moving said drilling means toward said workpiece such that the rate of travel of said drilling means toward said workpiece is reduced within a predetermined distance from said workpiece;

(d) fluid by-pass means in said circuit for by-passing said flow control means when said motive means is moving said rivet inserting and forming means relative to said workpiece; and

(e) control means connected in controlling relation to said flow control means and to said fluid by-pass means and responsive to which of said drilling means and said rivet inserting and forming means is engaged and moved by said motive means for operating said flow control means only when said drilling means is engaged and moved by said motive means and for operating said fluid by-pass means only when said rivet inserting and forming means is engaged and moved by said motive means.

4,515,303
ELECTRIC HAMMERING APPARATUS WITH AIR-CUSHIONED ARMATURE

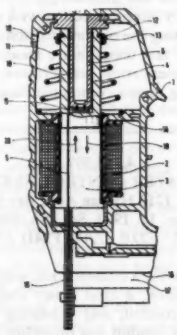
Fritz Schädlich, Leinfelden-Echterdingen; Werner Rieker, Steinenbronn; Rainer Thaler, Stuttgart, and Klaus Klingenstein, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,176

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232120

Int. Cl.³ B25C *1/00, 5/02, 5/06*

U.S. Cl. 227—131 **14 Claims**



1. Electric hammering tool apparatus, particularly nailing or stapling gun, having

a housing (1);

a plunger element (4) positioned for reciprocating movement in the housing;

a solenoid coil (2) and a return spring (11) forming a motive means (2, 11) respectively reciprocating the plunger element in the housing,

the plunger element forming an armature (4) in electromagnetic cooperation with said solenoid coil;

and comprising, in accordance with the invention,

an air throttle path (19) located in the path of movement of the plunger element and including a check valve (9) permitting free movement of the plunger element independently of throttling of the plunger element in a hammering direction (18), under power of the motive means, while damping movement of the plunger element in a return direction and rendering effective said air throttling path;

and a hollow cylinder (6) forming a guide means for said armature;

means (7) for securing one end (7) of the hollow cylinder in the housing;

an air vent opening communicating the interior of the hollow cylinder with ambient air outside of the housing;

and wherein the check valve (9) is located at the other end of the hollow cylinder, the plunger element being a cup-shaped piston element surrounding said hollow cylinder, with clearance, said clearance defining a narrow gap forming an air throttle path (19).

8. Electric hammering tool apparatus, particularly nailing or stapling gun, having

a housing (1);

a hollow cylinder (6) secured at one end (7) in the housing;

an air vent opening (8) communicating the interior of the hollow cylinder with ambient air;

a solenoid coil (2) and a return spring (11);

a plunger element (4) positioned for reciprocating movement in the housing,

the plunger element comprising a cup-shaped armature (4) in electromagnetic cooperation with said solenoid coil, closely surrounding the outside of said cylinder (6) leaving only a narrow gap, and guided by the cylinder in its reciprocating movement,

said narrow gap defining an air throttling path (19);

and a check valve (9) closing off air flow communication between the interior of the hollow cylinder (6) and said air vent opening (8) for permitting free movement of the plunger element in a hammering direction, while damping movement of the plunger element in a return direction under force of the return spring, and rendering effective said air throttling path by permitting escape of air sucked through the hollow cylinder into the interior of the cup-shaped armature only through said narrow gap defining said air throttling path (19).

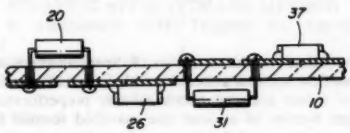
4,515,304
MOUNTING OF ELECTRONIC COMPONENTS ON PRINTED CIRCUIT BOARDS

Jean P. Berger, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 27, 1982, Ser. No. 424,031

Int. Cl.³ H05K *3/34*

U.S. Cl. 228—136 **11 Claims**



1. A method of mounting electronic components on printed circuit boards, comprising;

inserting leaded components on a first side of a circuit board, the leads passing through holes in the circuit board, said first side being uppermost;

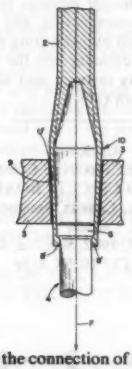
clinching the leads on a second side of the circuit board;
turning the circuit board over;
applying solder paste at the ends of the leads and on solder pads at predetermined positions on a circuit pattern on said second side through individual applicator nozzles;
positioning surface mounting components on said second side, contact positions on said components aligned with said solder pads;
reflow soldering to solder both said leads and said surface mounting components to said circuit pattern;
inserting further leaded components in said circuit board, said further components inserted on said second side of said circuit board, the leads passing through holes in the circuit board, said second side being uppermost;
clinching the leads of the further leaded components on the first side of the circuit board;
turning the circuit board over;
applying solder paste to the ends of the leads of the further leaded components through individual applicator nozzles; and
reflow soldering to solder the leads of the further leaded components to a circuit pattern on said first side, the soldering to the circuit pattern on said first side being carried out at a lower temperature than the soldering of leads and components to the circuit pattern on said second side.

4,515,305

CONNECTION OF THE TUBULAR ENDS OF A HEAT EXCHANGER MATRIX TO THE ASSOCIATED BOTTOM OF THE HEAT EXCHANGER

Klaus Hagemeister, Ebenhausen, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 445,709
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149285
Int. Cl.³ B23K *1/18*
U.S. Cl. 228—173.2 **19 Claims**



1. In a method for the connection of the tubular ends of tubes or hollow flow sections associated with a cross-countercurrent matrix of a heat exchanger to a suitably preperforated heat exchanger bottom of at least one manifold formed for the infeed or discharge of fluid into or from the respective heat exchanger matrix; the improvement comprising: deforming said tubular end by swaging or forging around an annular section of a mandrel; coating said tubular end with brazing alloy, inserting said tubular end and mandrel into an associated opening in the heat exchanger bottom, and pressing said tubular end against the adjacent wall of the opening and the upper and lower edges thereof and concurrently withdrawing the mandrel, and imparting localized heating to produce a metallurgical bond between the tubular end and the contacting portions of the heat exchanger bottom.

4,515,306

FOUR-TERMINAL ZONE THERMOSTAT

Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

Filed May 13, 1983, Ser. No. 494,411
Int. Cl.³ G05D *23/19*
U.S. Cl. 236—9 A **12 Claims**

1. Thermostatic means electrically interlocking fuel control means of heating/cooling means to motor means of automatic damper means, said damper means regulating and controlling a heating/cooling medium flowing from said heating/cooling means; said thermostatic means simultaneously operating said fuel control means and damper means; said thermostatic means comprising:

(a) switch means, said switch means having thermostatic switch means, said thermostatic switch means having four terminals, said terminals being electrically interconnected in selective combinations by a movable switch operator; said switch means, having connection to and, operating said fuel control means and said motor means in cooperation with motor control means;

(b) sensing means, said sensing means having a heat sensing element attaching to a movable shaft and an electric heater operable by current flow through said switch means;

(c) support means, said support means comprising a mountable base and hardware; said support means supporting said sensing means, said switch means and covering means; said covering means having temperature measuring means, light reflecting means, and temperature setting indicating means; said base having a separate plate mountable on an external surface and supporting said base;

(d) indicating means, said indicating means comprising light means electrically interconnecting with said switch means and communicating the operational status of said heating-/cooling means; said temperature measuring means communicating a present room temperature; said temperature setting indicating means communicating a boundary condition.

4,515,307

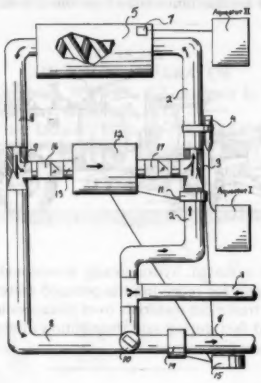
HOT WATER CONTROL SYSTEM

Andrew Ribaudo, Jr., 1213 Hyman Ave., Bay Shore, N.Y. 11706

Filed Dec. 12, 1983, Ser. No. 560,244
Int. Cl.³ F22B *27/00*; F24D *3/08*
U.S. Cl. 236—25 R **4 Claims**

1. A control system for a domestic hot water heating system having an input conduit, a cold water source to said input conduit, an output conduit, and a heating unit for heating water from said input conduit and providing hot water to said output conduit, a bypass conduit for the diversion of hot water from said output conduit to said input conduit, a first temperature detecting means located in said input conduit downstream from said bypass conduit connected to a mechanism for turning on and off said heating unit in response to detection of a predetermined first temperature level, a diverting means for

diverting hot water from the output conduit, through the bypass conduit to the input conduit, a pressure switch located



in said output conduit for detecting a first predetermined pressure level indicating a low demand for hot water from said output conduit.

4,515,308

FLOW STABILIZER FOR A VENTILATION DUCT

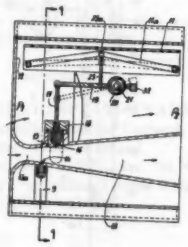
Pierre Jardinier, Gournay, and Jack Simonnot, Ozoire la Ferriere, both of France, assignors to Societe d'Etudes et de Recherches de Ventilation et d'Aerauliques, Gournay, France

Filed Feb. 1, 1983, Ser. No. 462,951

Claims priority, application France, Feb. 5, 1982, 82 01903

Int. Cl.³ F24F *13/08*

U.S. Cl. 236—49 **7 Claims**



1. A flow stabilizer for a ventilation duct, of the type comprising a body mountable in the duct, having at least a main duct, a chamber including therein a deformable bag in the main duct and a spring associated with the bag to nomally maintain the chamber in a state of minimum volume, a seat supporting the chamber and having an opening for entrance and exit of air into and out of the chamber, and means for fitting the seat to the body, the respective dimensions of the chamber and of the crosswise sections of the main duct being such that, under the action of pressure differences existing upstream and downstream, the variations of volume of the chamber which result therefrom modify the section for passage of the air in the space made between the walls of the chamber and those of the main duct, the improvement comprising:

a pressure sensor exposed to the flow of air in said main duct;

said opening for the chamber being interconnected by auxiliary pipe means to said pressure sensor, said pressure sensor including means for amplifying dynamic pressure resulting from the flow of air,

means, sensitive to the variations of a predetermined parameter other than pressure, for affecting at least one of the amplifying means or the position of the sensor, and

means, positioned downstream of said pressure sensor and coupled to said affecting means, for modifying volume of the deformable bag and hence the flow rate through the main duct of said body.

4,515,309

RAIL FASTENER ASSEMBLY AND COMPONENTS THEREOF

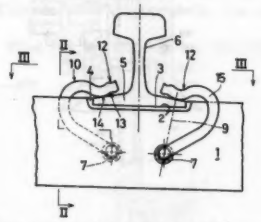
Erich F. Gehrke, Krugersdorp, South Africa, assignor to BTR South Africa Limited, Randburg, South Africa

Filed Apr. 28, 1982, Ser. No. 372,832

Claims priority, application South Africa, Apr. 29, 1981, 81/2832

Int. Cl.³ E01B *9/28*

U.S. Cl. 238—349 **13 Claims**



1. A rail fastener assembly comprising a sleeper having an upper support surface defining a bearing zone for receiving transversely extending rails, two transverse sockets extending from an outer end thereof to an inner end thereof into the sides of the sleeper at positions spaced downwardly from the upper support surface thereof, and wherein the sockets are each located beneath the portion of the sleeper supporting said rail such that the axis of each socket is located inwardly of a line extending at right angles to the upper surface within the bearing zone on the appropriate rail flange of the rail foot adjacent its outer extremity, a spring clip co-operating with each socket and having a spigot end rotatably received within the associated socket and a shaped region connected to said spigot end by an interconnecting length, said shaped region adapted to bear on the upper surface of the rail foot above the socket and outside the upper surface of said sleeper in which said rail is supported and wherein the interconnecting length of spring steel is of arcuate shape and designed to provide a required degree of resilience, said spring clip being rotatable about the axis of said spigot end between operative and inoperative positions.

4,515,310

SPRAYING APPARATUS AND METHOD

Robert W. Hengesbach, 27331 Tungsten Rd., Euclid, Ohio 44132

Continuation-in-part of Ser. No. 313,456, Oct. 21, 1981, abandoned. This application Jun. 1, 1983, Ser. No. 499,821

Int. Cl.³ B05B *7/30*

U.S. Cl. 239—8 **25 Claims**

1. A spraying apparatus, comprising:

(a) a vessel defining a pressurizable chamber having a lower region for receiving a quantity of liquid to be sprayed, and an upper region for receiving pressurized carrier gas for pressurizing the contents of the chamber;

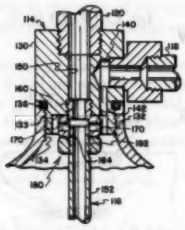
(b) inlet means for communicating the upper region with a source of pressurized carrier gas;

(c) nozzle means for receiving a mixture of pressurized

carrier gas and liquid from the vessel for discharge as a spray,

(d) outlet means for ducting a pressurized mixture of liquid from the lower region and carrier gas from the upper region along a common path of flow for discharge through the nozzle means as a spray, the outlet means including:

(i) elongate tubular means defining a tubular passage extending from the lower region into the upper region, the tubular means having at least one liquid entry opening communicating the tubular passage with the lower region for admitting liquid under pressure from the lower region into the tubular passage, and having at least one gas entry opening communicating the tubular passage with the upper region for admitting carrier gas under pressure from the upper region into the tubular passage;



(ii) passage-defining means cooperating with the tubular means for defining a common path of flow for liquid admitted to the tubular passage through the liquid entry opening, and for gas admitted to the tubular passage through the gas entry opening, the common flow path extending from the location of the gas entry opening to the nozzle means; and,

(e) adjustment means for controlling the effective size of the gas entry opening to selectively vary the rate at which liquid is ducted along the common flow path, the adjustment means including first and second means which are threadably interconnected and which are relatively movable, with the gas entry opening being defined between portions of the relatively movable first and second means to enable the effective size of the gas entry opening to be controlled by threading the first and second means to move the portions toward and away from each other for controllably obstructing the flow of pressurized carrier gas through the gas entry opening.

4,515,311

LIQUID WASTE APPLICATION SYSTEM WITH SLUDGE GUN

Harry H. Takata, Edina, Minn., assignor to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.

Filed May 6, 1983, Ser. No. 492,475

Int. Cl.³ A01G *25/09*

U.S. Cl. 239—172 **8 Claims**

6. Distribution apparatus for surface applying relatively viscous liquid soil treatment materials comprising in combination:

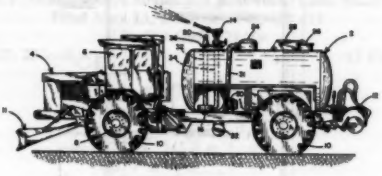
a. a mobile distribution tank for containing a quantity of soil treatment materials, including in excess of 10% solids, under positive and negative pressure conditions;

b. means for transporting said tank over a variety of ground conditions and terrains;

c. air pump means selectively operable during a loading mode for vacuum loading said tank and for alternatively pressurizing said tank, during a distribution mode;

d. an inlet port coupled to said tank for receiving treatment materials from an external source during said loading mode;

e. pump means operative during said distribution mode for pumping said treatment materials from said tank at flow rates of several hundreds of gallons per minute; and



f. a turret mounted, hydraulically directionally controllable sludge gun for receiving the pumped materials and ejecting the treatment materials over distances in excess of one hundred feet during said distribution mode in a clog and cavitation free manner.

4,515,312

APPARATUS FOR DISPOSAL OF SLUDGE IN A FLOATING ROOF TYPE OIL TANK

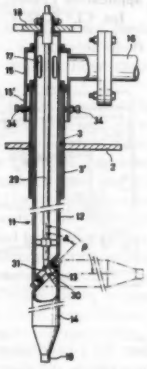
Nobuyuki Manabe, Fujisawa, and Takahiro Goto, Yachiyo, both of Japan, assignors to Taiho Industries Co. Ltd. and O.P.E. Co. Ltd., both of Tokyo, Japan

Division of Ser. No. 366,319, Apr. 7, 1982, Pat. No. 4,426,233. This application Jan. 3, 1984, Ser. No. 567,881

Claims priority, application Japan, Sep. 11, 1981, 56-142446; Dec. 28, 1981, 56-209734

Int. Cl.³ B05B *3/12*

U.S. Cl. 239—227 **19 Claims**



1. Fluid spurting apparatus, comprising:

support means;

means mounting a first cylindrical member within said support means for axial and rotary movement relative to said support means;

means rotatably mounting a second cylindrical member upon said first cylindrical member for movement between two extreme positions, and second cylindrical member having a fluid spurting nozzle mounted thereon, wherein when said second cylindrical member is disposed in a first one of said two extreme positions, said first and second cylindrical members are coaxially aligned, and when said second cylindrical member is disposed in a second one of said two extreme positions, said first and second cylindrical members are not coaxially aligned; and

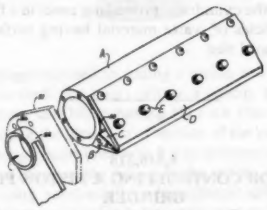
means for rotating said second cylindrical member relative to said first cylindrical member between said two extreme positions comprising a control rod extending substantially axially within said first cylindrical member and operatively connected to said second cylindrical member.

4,515,313

AIR KNIFE APPARATUS

Kenneth M. Cavanagh, Warwick, R.I., assignor to Marshall and Williams Company, Greenville, S.C.

Filed Dec. 27, 1982, Ser. No. 452,884
Int. Cl.³ B05B *1/32*
U.S. Cl. 239—455 **2 Claims**



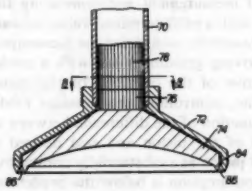
1. An air knife including an elongated plenum having a longitudinal opening comprising:
a longitudinal support on one side of said opening;
a longitudinal plate forming a flexible baffle extending on said one side of said opening and being fixed across said support adjacent said opening forming one side of a longitudinal orifice opposite said opening;
a longitudinal flexible blade fixed to said plenum, along the other side of said opening presenting a free edge portion opposite said baffle;
threaded means spaced along said opening extending between said blade and said support for drawing the free edge portion of said blade toward and away from said baffle varying the size of said orifice permitting adjustment therealong; and
said baffle and said blade presenting a converging substantially streamlined flow path.

4,515,314

LIQUID SPRAY APPARATUS

William J. P. Currall, Swindon, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Nov. 1, 1982, Ser. No. 438,388
Claims priority, application United Kingdom, Nov. 3, 1981, 8133077; Nov. 14, 1981, 8134383
Int. Cl.³ B05B *1/34*
U.S. Cl. 239—466 **10 Claims**



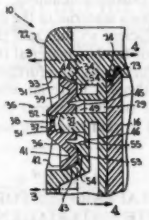
1. Liquid spray apparatus comprising a liquid supply duct, a surface at one end of the duct onto which the liquid is adapted to impinge, a nozzle for distributing the liquid after it has passed over the surface, means for imparting a swirling motion to the liquid and means for varying the flow rate of liquid through the liquid spray apparatus, in which the means for varying the flow rate of liquid through the liquid spray apparatus comprises first and second splined members located within a hollow portion of the liquid supply duct, the second splined member abutting the end of the first splined member, the outer ends of the splines of each splined member cooperating with the walls of the duct so that the liquid is constrained to flow along the spaces between the splines, the first and second splined members being relatively rotatable such that the splines on the first and second members can be moved in and out of alignment whereby the rate of flow of liquid through the spaces is varied.

4,515,315

NOZZLE INSERT FOR A FLUID DISPENSER

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Filed Jun. 8, 1983, Ser. No. 502,275
Int. Cl.³ B05B *1/34*
U.S. Cl. 239—491 **5 Claims**



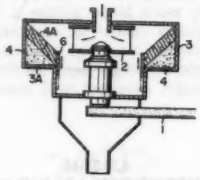
1. An actuator head for a fluid dispenser, the head comprising a body having an open bore and a discharge passage leading to said bore, said body being of a material of predetermined hardness and having a cylindrical probe concentric to said bore, a nozzle insert seated within said bore on said probe and defining a swirl chamber with said probe, said bore being defined by a smooth cylindrical wall of constant diameter, said insert comprising a circular body having a central portion containing a discharge orifice in communication with said swirl chamber, an annular, conical flange diverging in an outward direction of said bore and being connected to said central portion along a circular hinge line for radial flexing movement about said hinge line and without deformation upon being seated within said bore, an inner conical surface of said flange forming an acute angle with a confronting outer surface of said central portion, a terminal end wall and an outer conical surface of said flange together defining an acute angle therebetween which presents a sharp outer peripheral edge of a diameter slightly greater than said constant diameter in a relaxed condition of said flange such that said flange is caused solely by said wall of said bore to flex radially inwardly about said hinge line, without deformation, upon seating said insert within said bore, and said insert body being of a harder material than that of said head body material such that in a seated position of said insert within said bore said sharp outer edge penetrates into said head body material as said flange flexes by itself, without deformation, radially outwardly about said hinge line, said conical flange thereby defining a circular, self-locking pawl for alone positively locking and sealing said insert in said seated position within said bore, and any force applied in said outward direction of said bore tending to further penetrate said sharp edge into said body material.

4,515,316

METHOD OF WITHDRAWING PARTICULATE MATERIAL FROM DEAD-BED OF CENTRIFUGAL CRUSHER AND CENTRIFUGAL CRUSHER SUITABLE FOR CARRYING THE METHOD INTO PRACTICE

Mitsuru Kawaguchi, Kure, Japan, assignor to Kotobuki Engineering & Mfg Company, Ltd., Kure, Japan

Filed Apr. 22, 1983, Ser. No. 487,467
Claims priority, application Japan, Apr. 27, 1982, 57-71964
Int. Cl.³ B02C *19/00*
U.S. Cl. 241—5 9 Claims



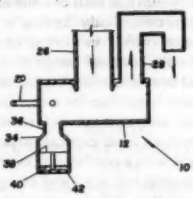
1. A method for crushing material, comprising:
feeding material to be crushed to a rotor within and spaced from an annular crushing chamber;
throwing said material tangentially from said rotor by centrifugal force to collide with a dead-bed of particulate material in the crushing chamber;
retaining said thrown material in the crushing chamber for a time period sufficient so that said thrown material serves as a dead bed for further material thrown from said rotor and is crushed further by said further thrown material; and
discharging said thrown material after said retaining step, substantially all of the material thrown from the rotor being subjected to said retaining step.

4,515,317

METHOD OF AND APPARATUS FOR GRINDING SOLID ORGANIC WASTE MATERIAL ENCOUNTERED IN SEWAGE WASTE AND WASTE WATER RECLAMATION

David M. Sparkman, Brigham City, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 344,849, Feb. 1, 1982, abandoned. This application Nov. 18, 1983, Ser. No. 553,201
Int. Cl.³ B02C *19/06*
U.S. Cl. 241—5 5 Claims



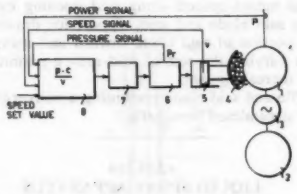
1. A process for grinding solid organic waste material encountered in sewage waste treatment and waste water reclamation into homogeneous sized particles suitable for pumping and further processing in a waste treatment system comprising,
tangentially injecting into a shallow cylindrical processing zone at a plurality of positions spaced around the periphery thereof jet streams of incompressible fluid thereby to form within the processing zone a substantially planar fluid vortex having a low pressure region at the center thereof, the axis of the cylindrical processing zone being disposed in a generally vertical direction and being substantially coincident with the center of the vortex,
introducing under the force of gravity only influent containing solid waste material to be ground into the low pressure region of the vortex thereby to cause the waste material to be drawn and swept up into the vortex and spun around the cylindrical processing zone and to allow centrifugal force to force the waste material to the peripheral region of the processing zone so that the waste material is repeatedly passed directly through the jet streams of fluid and is cut up into progressively smaller particles as the waste material is towed around the chamber by laminar frictional drag of the waste material in the flow stream of the vortex until the surface areas of the particles of waste material are reduced to a size such that frictional drag forces are at or below molecular adhesion forces which tend to bind the particles of waste material to the flow stream of the vortex, and
discharging against the force of gravity from a peripheral region of the cylindrical processing zone, in a fluid suspension, particles of waste material having surface areas of such reduced size.

4,515,318

METHOD FOR CONTROLLING A PISTON FED WOOD GRINDER

Aslak Savonjousi, Espoo, Finland, assignor to Kymi-Stromberg Oy, Helsinki, Finland

PCT No. PCT/FI80/00005, § 371 Date Jul. 1, 1981, § 102(e) Date Jul. 1, 1981, PCT Pub. No. WO81/01303, PCT Pub. Date May 14, 1981
Continuation of Ser. No. 280,006, Jul. 1, 1981, abandoned. This PCT application Nov. 5, 1980, Ser. No. 561,139
Claims priority, application Finland, Nov. 8, 1979, 793500
Int. Cl.³ B02C *25/00*
U.S. Cl. 241—28 5 Claims



1. A method for controlling a piston fed wood grinder, wherein a plurality of wood charges are fed by pressure media driven pistons against a motor driven grinding stone comprising the steps of driving each of said pistons toward said grinding stone, determining a value for the actual speed of movement between selected positions of each of the pistons by direct digital measurement and comparing the value of the actual speed with a predetermined value indicative of a desired speed, simultaneously comparing the consumption of power by the motor driving grinding stone with a predetermined limit value indicative of the overload of the motor driving said grinding stone, controlling the pressure media driving said piston as a function of the difference between the value of the actual speed of the piston and said desired speed value to maintain said piston at a substantially constant speed so long as the power consumption is below the predetermined overload limit and upon said power consumption reaching the overload limit automatically shifting the control of the pressure media driving said piston as a function of the power consumption to vary the speed of said piston until the power consumption falls below the predetermined overload limit and thereafter returning control of said pressure media driving said piston as a function of the difference between the value of the actual speed of said piston and the predetermined value of the desired speed.

4,515,319

DUAL-INCLINED LIFTERS FOR AUTOGENOUS MILLS

Yun-Song Wei, 1005 Dana Ave., Apt. 9, Cincinnati, Ohio 45229

Continuation-in-part of Ser. No. 396,494, Jul. 8, 1982, abandoned. This application Feb. 10, 1984, Ser. No. 578,870

Int. Cl.³ B02C *17/22*

U.S. Cl. 241—284 9 Claims

1. In an autogenous mill including a casing and a number of lifters on both shell and liners within a casing, the improvement comprising said lifters having (1) rock lifter bars which are inclined along the direction of motion of the mill, said rock lifter bars having center lines which will substantially coincide with the mean locus of the falling rocks within the mill, said mean locus being substantially a logarithmic spiral, and said center lines being straight for better resistance to buckling and (2) carriers for withdrawal of crashed fines, said carriers having an angle of inclination smaller than that of said rock lifter bars, further in said carriers having their surfaces which will allow the mean locus of the crashed fines to pass through the center of the mill or the suction pipe.

4,515,320

TRAVERSE WINDING FRAME FOR PRODUCING THE WINDING OF A PACKAGE

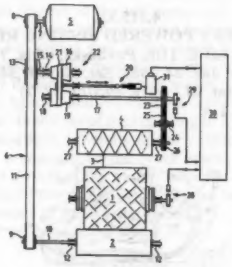
Walter Slavik, Horgen, and Arthur Rebsamen, Sellenburen, both of Switzerland, assignors to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Sep. 27, 1983, Ser. No. 536,323

Claims priority, application Switzerland, Sep. 27, 1982, 5689/82

Int. Cl.³ B65H *54/08, 54/28*

U.S. Cl. 242—18 DD 5 Claims



1. A transverse winding frame for precision winding of thread into a package, comprising:

package support means for rotatably supporting a package to be wound with thread;

a rotatably mounted friction roller for rotatably driving the package;

a rotatably mounted cam shaft supporting a thread laying device;

a single constant-speed drive motor for powering rotation of said friction roller and said cam shaft;

a belt transmission coupling said drive motor to said friction roller and said cam shaft;

infinitely variable transmission means, coupling said belt transmission to said cam shaft, for varying rotation speed of said cam shaft, said variable transmission means including a servomotor for operating said variable transmission means;

first and second tachometers operatively coupled to said package support means and said cam shaft, respectively, for generating output signals representative of rotation speeds of the package and said cam shaft; and

control means, coupled to said tachometers and said servomotor, for comparing said output signals of said tachometers and for transmitting a control signal to said servomotor dependent upon said output signals and upon preprogrammed helix angle tolerances and winding ratios.

4,515,321

METHOD TO CUT OFF A PREFERABLY BAND SHAPED RUNNING WEB OF TEARABLE MATERIAL AND MEANS TO CARRY OUT THE METHOD

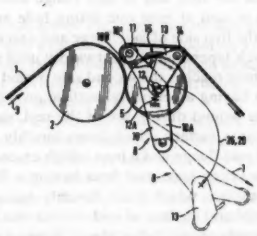
Sture Kahlman, Strandvägen 22, 666 00 Bengtsfors, Sweden

Filed Mar. 15, 1983, Ser. No. 475,480

Claims priority, application Sweden, Mar. 15, 1982, 8201606

Int. Cl.³ B65H *19/20, 35/10;* B26D *1/12;* B26F *3/02*

U.S. Cl. 242—56 R 9 Claims

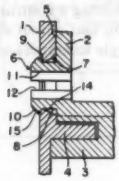


1. A method of cutting off a band-shaped running web of tearable material and feeding an end of the web of material to the reel around which the web of material shall be wound and on which it shall be supported respectively, comprising the steps of moving a reel into contact with said running web, deviating a portion of said running web which is out of contact with said reel around at least one deviation means at a predetermined distance from the reel whereby said web of material is wound around the reel, moving a cutting apparatus so that it can act upon a portion of the web of material which runs between the reel and said deviation means, said cutting apparatus having a point for perforating the web of material at the center portion of the web, moving said cutting apparatus towards said web of material in the direction of the movement of the web along the reel at a speed which is lower than the speed of the forward feed of the web to perforate said web, so that the web of material during its continued forward feed around the reel toward the deviation means is torn apart from the area of perforation of the material backwards against the movement of the web of material in a direction towards the respective two lateral edges of the web of material, and guiding a free end of the web of material thus cut-off by said cutting apparatus along the reel so that it is introduced between the reel and a portion of the web of material which runs to the reel.

4,515,322
REEL FOR A MAGNETIC TAPE

Haruo Shiba; Yoshiya Sakata, and Kimio Tanaka, all of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,356
Claims priority, application Japan, Sep. 22, 1982, 57-142583[U]
Int. Cl.³ B65H 75/18
U.S. Cl. 242—71.8 7 Claims



1. A reel for magnetic tape, said reel comprising:

(a) a flange having at least one fitting hole extending therethrough from a first side thereof to a second side thereof, said at least one fitting hole having a certain shape and certain dimensions at the first side of said flange, having a first tapered peripheral surface which tapers radially inwardly from the first side of said flange until the radial dimensions of said at least one fitting hole are less than they are at the first side of said flange and a second tapered surface which tapers radially outwardly until said at least one fitting hole reaches the second side of said flange, and

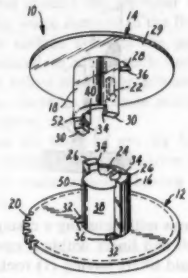
(b) a reel hub having a peripheral surface on which a magnetic tape is wound during use of the reel, said reel hub having a planar surface which bears forcibly against the first side of said flange and a boss which extends into said at least one fitting hole, said boss having a first tapered peripheral surface which bears forcibly against the first tapered peripheral surface of said at least one fitting hole during assembly of said hub and said flange and a second tapered peripheral surface which bears forcibly against the second tapered surface of said at least one fitting hole once said reel hub and said flange have been assembled, said boss being sized and shaped to fit through said at least one fitting hole but having maximum radial dimensions between its first and second tapered surfaces which exceed the minimum radial dimensions of said at least one fitting hole between its first and second tapered surfaces, said boss having at least two at least generally radially oriented, axially extending dividing slots therein which divide said boss into segments and which permit the segments of said boss to flex radially inwardly as said boss is forced through said at least one fitting hole during assembly, the axial distance between the planar surface of said reel hub and the second tapered surface of said boss being such that the segments of said boss are flexed radially inwardly when said flange and said reel hub are in their assembled condition,

whereby said flange and said reel hub are firmly held together in their assembled condition by engagement of the second tapered surface on said boss with the second tapered surface in said at least one fitting hole and by engagement of the first side of said flange and the planar surface of said reel hub.

4,515,323
TAPE SPOOL

Robert M. Rood, Woodbury, and James J. Wulfing, Afton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1983, Ser. No. 542,415
Int. Cl.³ B65H 75/28
U.S. Cl. 242—74.1 12 Claims



9. A tape spool having a cylindrical tape-winding surface and comprising two hub parts and means for wedging said hub parts together to define a narrow passage that opens through the tape-winding surface and pinches an end of a tape member, wherein the improvement comprises:

a tubular member defining one of said hub parts and having a generally circular interior wall, an exterior wall defining said cylindrical tape-winding surface and a slot which connects said interior and exterior walls to partially define said passage that opens through said tape-winding surface;

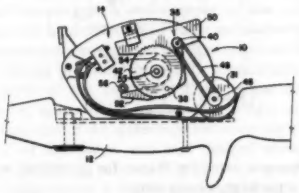
a cylindrical member defining the other of said hub parts and having an exterior surface spaced from said interior surface of said tubular member, when said hub parts are wedged together, to define the remainder of said passage; and

at least one tongue extending from said exterior surface of said cylindrical member and at least one corresponding groove in said interior wall of said tubular member, said tongue and said groove being tapered axially with respect to said tubular and said cylindrical members to progressively pinch said end of said tape member as said hub parts are wedged together.

4,515,324
BATTERY POWERED FISHING REEL

Felix R. Barton, 123 E. 11th, Pawhuska, Okla. 74056

Filed Jun. 24, 1983, Ser. No. 507,348
Int. Cl.³ A01K 89/017, 87/06
U.S. Cl. 242—84.1 A 6 Claims



1. A fishing reel comprising spool means having a line wound thereon, drive means operably connected with the spool means for selective actuation thereof to facilitate winding of the line thereon, said drive means comprising power means secured in the proximity of the spool means, gear train means interposed between the power means and the spool means and having alternate engaged and disengaged positions for providing the selective activation of the spool means in one

direction upon energization of the power means, switch means operably connected with the power means for energization thereof, lever means interposed between the power means and switch means and operably connected with the gear means, the lever means being selectively movable for providing the engaged and disengaged positions of the gear train means and intermittent actuation of the switch means for intermittent energization of the power means, and wherein the lever means carries at least one gear of the gear train means and includes means for engaging the switch means whereby the one gear is brought into operative engagement with the gear train prior to engagement of the switch means.

4,515,325

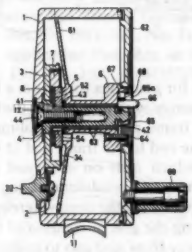
FLY REEL

Takeshi Ito, Nagano, Japan, assignor to Coret & Co. Ltd., Tokyo and Machine Engineering Co., Ltd., Nagano, both of, Japan

Filed Oct. 25, 1982, Ser. No. 436,478

Int. Cl.³ A01K *89/02*

U.S. Cl. 242—84.51 R **3 Claims**



1. In a fly reel wherein a brake is supported on a frame, a brake wheel and a spool are coaxially supported on a shaft, and a one way clutch is interposed between the brake wheel and the spool, the improvement comprising; a clutch wheel rotating integrally with the spool, a recessed portion inside the brake wheel, said clutch wheel being positioned inside said recessed portion, at least one of the outer periphery of the clutch wheel and the peripheral wall of the recessed portion of the brake wheel including recessed and protruded portions, so that the width of an annular gap formed therebetween varies to become larger and smaller, roller means having an intermediate width with respect to the minimum and maximum widths of said annular gap and being inserted into said gap, reversible spring means for urging said roller means in the small width direction of said gap, and mounting means on said brake wheel for selectively mounting said spring means in one of two positions for right-handed and left-handed, respectively, operation of the reel, the directions of urging being in opposite directions for the two positions, whereby in one rotational direction the clutch wheel is engaged by the brake wheel, and in the opposite rotational direction the clutch wheel is disengaged from said brake wheel, the rotational directions being different for said two positions of said spring means.

4,515,326

ARRANGEMENT FOR LOCKING THE WINDING DEVICE OF A VEHICLE SAFETY-BELT

Hans I. R. Karlsson, Vintervägen 17, S-175 40 Järfälla, Sweden

Filed Aug. 25, 1983, Ser. No. 526,361

Claims priority, application Sweden, Sep. 13, 1982, 8205212

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **16 Claims**

1. A locking arrangement for a winding device of a vehicle safety-belt, said winding device including a spindle journalled for rotation in two, mutually opposite directions, a strap which forms a part of said belt, being connected to said spindle and arranged to be wound onto and unwound from said spindle, and spring means coupled to said spindle so as to be tensioned when the spindle rotates in the strap-unwinding direction and to drive the spindle in the opposite direction to wind the strap thereonto,

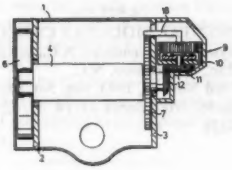
said locking arrangement comprising:

a first body arranged for rotation in two mutually opposite directions around a stationary rotary axis and connected to said spindle so as to rotate about said rotary axis with rotation of the spindle, said first body having a side surface extending at right angles to said rotary axis;

a second, circular-cylindrical body arranged for free movement in all directions relative to said first body and having a side surface located adjacent to and parallel with said side surface of said first body, and subjected to a force acting in a direction towards said first body;

said side surface of one of said bodies being provided with a plurality of recesses which are symmetrically located in relation to the center axis of said surface, each of said recesses having a substantially circular configuration and a depth which decreases gradually in all directions from the center of said recess;

a spherical ball having a diameter exceeding the greatest depth of said recesses being located in each of said recesses;



said side surface of the other one of said bodies being provided with a recess for accommodating a respective one of said balls, said recess being arranged to accommodate part of that portion of the ball protruding beyond said side surface of said one body;

a stationary cylindrical surface coaxially surrounding said moveable, second body at a distance from the cylindrical surface of said body, said stationary cylindrical surface and the cylindrical surface of said moveable body being so arranged that the moveable body is prevented from rotating in a direction corresponding to the direction in which said strap is unwound from said spindle, when said cylindrical surface of the moveable body is brought into contact with said stationary cylindrical surface;

a locking mechanism which can be activated to lock said spindle against rotation in said direction corresponding to the direction in which said strap is unwound; and

coupling means operatively coupling said moveable second body to said locking mechanism in a manner activating said locking mechanism when said second body is moved axially through a given shortest distance away from said rotatably journalled first body.

4,515,327

YARN BOBBIN

Fred C. Ashley, Columbus, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

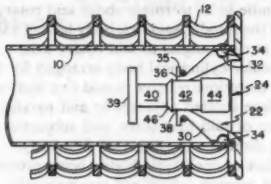
Filed Mar. 26, 1984, Ser. No. 593,675

Int. Cl.³ B65H *75/10, 75/14*

U.S. Cl. 242—118.3 **9 Claims**

1. A yarn take-up apparatus comprising: a hollow, elongated cylinder with an upstanding flange on one end, a plurality of detents on the inside of said cylinder at the other end, a yarn winding tube telescoped over and substantially coextensive with said cylinder and an end cap secured in said other end of said cylinder preventing said yarn winding tube from being

removed from said cylinder, said end cap having a body portion and a locking member slidably mounted in said body portion, said body portion having a first upstanding flange engaging the end of said cylinder and a second portion extending into the interior of said cylinder, said second portion having a groove in the periphery thereof engaging said detents, said second portion having a plurality of fingers forming collectively a circular opening around said locking member, said locking member in one position spreading said fingers to secure said groove against said detents and in a second position allowing the end to be removed from said cylinder.



4,515,328

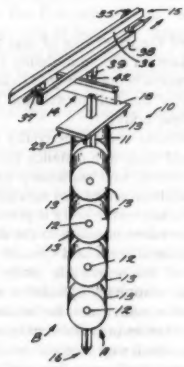
INCREMENTAL MODULAR CREEL SYSTEM

William M. Payne, Jr., Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 17, 1983, Ser. No. 552,799

Int. Cl.³ B65G *7/00;* **B65H** *49/14, 67/02;* **D01H** *9/00*

U.S. Cl. 242—131 **21 Claims**



11. A creeling system comprising:

a plurality of creel modules, each module having one or a plurality of yarn package-receiving creel pins associated therewith, formed in at least one row;

means for loading yarn packages onto said creel pins at a loading station;

means for conveying said modules to and from said loading station;

a stationary creel frame for receipt of a plurality of said modules;

means for transferring said modules from said conveying means to said stationary creel frame, and from said creel frame to said conveying means; and

cooperating mounting means on each of said modules and said creel frame for holding said modules in position on said creel frame for removal of yarn from the yarn packages received by said modules.

4,515,329

FEED DEVICE FOR GUIDING A ROPE ONTO A WINDING DRUM

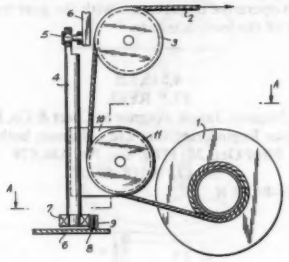
Johannes Sandvik, Stokke, Norway, assignor to Elkem a/s, Oslo, Norway

Filed Nov. 7, 1983, Ser. No. 549,168

Claims priority, application Norway, Nov. 15, 1982, 823804

Int. Cl.³ B65H *57/28*

U.S. Cl. 242—157.1 **4 Claims**



1. A feed device for guiding a rope from a fixed frame pulley onto a winding drum mounted on a frame wherein said device comprises a fixed frame pulley, a pendulum which is spherically pivoted at one end to the frame and at its second end has secured a roller which rolls on a curved path on a flange mounted on the frame said pendulum having mounted thereon at least one guide pulley for the rope whereby the guide pulley may be moved along the axis of rotation of the winding drum and toward and away from said axis to maintain a substantially constant distance of rope between said fixed frame pulley and winding drum.

4,515,330

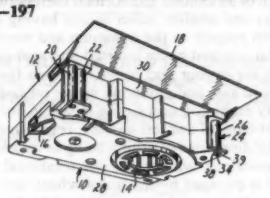
TAPE ROLLER FOR A TAPE CASSETTE

James J. Wulfing, Afton, and Robert M. Rood, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1983, Ser. No. 542,416

Int. Cl.³ G03B *1/04;* **G11B** *15/32;* **B65H** *17/22*

U.S. Cl. 242—197 **7 Claims**



1. Tape roller for a tape cassette defined by a housing having two broad parallel walls, said roller comprising:

two coaxial bearings extending toward each other from said housing walls, said bearings each including a taper which narrows with increasing distance from its respective wall;

at least one of said housing walls including a transverse wall surrounding its associated bearing to define a housing wall hole having dimensions which afford a clearance between said transverse wall and said associated bearing;

a plurality of resilient bridge members connecting said transverse wall defining said hole and said associated bearing, said bridge members permitting resilient movement of said associated bearing in a direction perpendicular to the planes of said housing walls while restricting movement of

said associated bearing parallel to the planes of said housing walls;

a sleeve including tubular ends each having an inner diameter sized to contact each of said bearing tapers, said sleeve having a length sufficient to cause said resilient movement of said associated bearing when said housing walls are assembled to define said tape cassette;

said resilient movement of said associated bearing creating a force which maintains said tapers in contact with said sleeve.

4,515,331

HUB FOR MAGNETIC TAPE CASSETTES, ESPECIALLY COMPACT CASSETTES, AND MAGNETIC TAPE CASSETTE POSSESSING ONE OR MORE SUCH HUBS

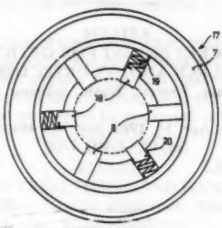
Werner Stümpfl, Ludwigshafen; Günter Bettinger, Schifferstadt; Friedrich Engel, Frankenthal; Horst Fitterer, Mannheim; Norbert Kreimes, Ludwigshafen; Dietmar Pfefferkorn, Hemsbach; Norbert Schäffer, Diedesheim, and Kurt Schmidts, Kehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 316,072

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 8028933[U]; Feb. 19, 1981, 8104557[U]; Feb. 19, 1981, 8104556[U]

Int. Cl.³ G11B *23/04*

U.S. Cl. 242—199 **12 Claims**



1. A hub for magnetic tape cassettes, especially for compact cassettes, for use with a transport apparatus having a drive spindle provided with projecting keys, said hub being displaceable in said cassette in at least the radial direction, and comprising a ring member on whose inner periphery there are arranged teeth for driving engagement by said projecting keys on the drive spindle,

wherein said teeth include, in circumferentially spaced relation, a plurality of immovable teeth which are radially spaced from the spindle, and also, in the same plane with said immovable teeth, at least one movable tooth which is spring-biased against the ring member to exert radial pressure on the drive spindle, so as to resiliently couple said hub to said spindle and thereby counteract abrupt displacements of the hub relatively to the cassette and hence reduce corresponding fluctuations in pitch during the operation of the cassette.

4,515,332

CULINARY UTENSIL SUPPORT

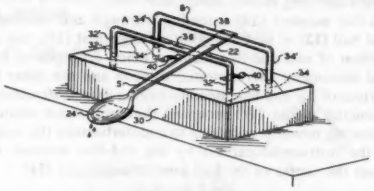
Madelon L. Scharfy, P.O. Box 249, Lake Arrowhead, Calif. 92352

Filed Jan. 25, 1982, Ser. No. 342,158

Int. Cl.³ A47G *21/14*

U.S. Cl. 248—37.3 **3 Claims**

1. The combination of a support and a culinary utensil wherein said utensil includes a food manipulating portion and an interconnected handle portion; and said support includes a pair of parallel spaced apart horizontally extending, substantially coextensive support members, one of the support members having a horizontally extending upwardly facing utensil engaging portion of straight line configuration and the other of the support members having a horizontally extending downwardly facing utensil engaging portion of straight line configuration, the downwardly facing utensil engaging portion being at a level higher than the level of the upwardly facing utensil engaging portion, and a body means for maintaining said support members and including a bottom surface for supporting said support members in spaced relation above a supporting surface, and each support member including downwardly extending columnar members at ends thereof releasably interconnected with said body means, whereby said utensil is disposed at a substantially right angle to said support members with the handle portion thereof adapted to extend between said support members with the handle portion thereof most adjacent the food manipulating portion supported on the upwardly facing utensil engaging portion of one of said support members and the handle portion most removed from the food manipulating portion supported by the downwardly facing portion of the other of said support members thereby causing the food manipulating portion of said utensil to be disposed in spaced relation from said support.



4,515,333

ADJUSTABLE SUPPORT FOR AN OPTICAL OR OTHER INSTRUMENT

Stuart Pugh; Douglas G. Smith, both of Loughborough, England; Chee M. Lee, Jurong Town, Singapore; Leslie R. Parr, Leicester; John N. Birkett, Aylesbury, both of England; Richard G. Stibbs, Glasgow, Scotland, and Tet C. Tai, Petaling Jaya Selangor, Malaysia, assignors to University of Technology, Leicestershire, England

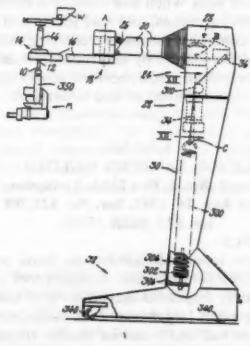
PCT No. PCT/GB81/00068, § 371 Date Dec. 14, 1981, § 102(e) Date Dec. 14, 1981, PCT Pub. No. WO81/03054, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 14, 1981, Ser. No. 333,870

Claims priority, application United Kingdom, Apr. 15, 1980, 8012388

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—122 **11 Claims**



1. An adjustable support for an optical or other instrument (M) including a linkage system (16,20) rotatably supported about a column (30), which linkage system permits adjustment of the position of the instrument in a predetermined spatial

envelope, and means comprising a ball joint arrangement, comprising a ball (12) and a ball-supporting member (102), for carrying the instrument on a free end portion of said linkage system (16,20) remote from said column (30), which instrument-carrying means permits adjustment of the orientation of the instrument at any given position within said spatial envelope, clamping means (110) which normally clamps the ball (12) against rotation relatively to the ball-supporting member (102) but which may be caused to unclamp the ball on actuation of a switch (or like) device, and means (300) for counterbalancing the linkage system (16,20) about a horizontal pivot (22) in the vicinity of the column (30), characterized in that the instrument-carrying means comprises:

a rod-like member (10) extending through and secured to said ball (12) of said ball joint arrangement (14), one end portion of said rod-like member being arranged to have said instrument (M) mounted thereon and the other end portion of the rod-like member having adjustable counterbalancing means (W) mounted thereon, which counterbalancing means is adjutable to counterbalance the weight of the instrument carried by the rod-like member (10) about the center of the ball joint arrangement (14).

4,515,334

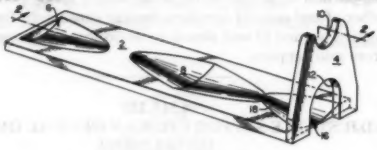
CONTAINER RACK

Edward A. Horne, 3059 Oak Leaf Ct., Woodbridge, Va. 22192

Filed May 4, 1982, Ser. No. 374,777

Int. Cl.³ A47B *73/00*

U.S. Cl. 248—146 **5 Claims**



1. A rack for a container having a neck, shoulder, and bottom comprising:

a base comprising shoulder receiving means for receiving said shoulder and bottom receiving means for receiving said bottom, said shoulder receiving means and said bottom receiving means being substantially coplanar, and

support means at one end of said base extending transversely to said base for receiving the neck of said container in either an upper or a lower end of said support means, said shoulder receiving means being intermediate said support means and said bottom receiving means,

said upper end of said support means comprises means for receiving said neck when said bottom is received by said bottom receiving means, and said lower end of said support means comprises means for receiving said neck when said shoulder is received by said shoulder means, whereby said neck is elevated when received in said upper end and depressed when received in said lower end.

4,515,335

CANOE LANTERN HOLDER

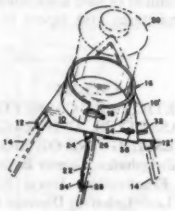
William P. DeRosett, Rte. 4, Box 236A, Livingston, Tenn. 38570

Filed Aug. 16, 1982, Ser. No. 523,708

Int. Cl.³ B63B *17/00*

U.S. Cl. 248—231.5 **1 Claim**

1. A holder for mounting lanterns on boats comprising: a base plate assembly formed from weatherproof material and defining a generally trapezoid-shaped surface, said base plate assembly having a first larger trapezoid-shaped surface with a narrower forward end and a second smaller trapezoid-shaped surface with a narrower forward end, said larger base plate portion being pivotally mounted at said narrower forward end to said narrower forward end of said smaller base plate portion; a bolt mounted in said first surface, said bolt aligned to move through a slot in said second surface whereby said first and second surfaces are adjustable to conform to the end configuration of the gunwales of the boat and whereby said holder is secured by a nut on said bolt; a compressible cylindrical receptacle vertically mounted upon said base plate assembly, a latch within a spaced opening in said cylindrical receptacle being



operable to compressibly retain a lantern therewithin; and two channel edges on the opposite nonparallel sides of said base plate assembly, said channel edges turned downward and inward to conform to the shape of the gunwales of the boat, said channel edges, together with a strap adapted to be attached from the aft portion of the holder to an eyelet in a floor of the boat, being operable to retain said holder thereon.

4,515,336

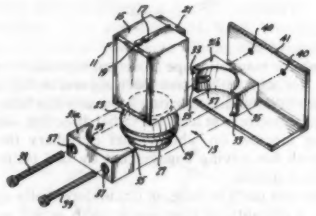
BALL AND SOCKET MOUNT FOR OPTICAL SENSING SYSTEM SOURCE AND/OR DETECTOR DEVICES

William H. Fischer, Everett, Wash., assignor to Opcon, Inc., Everett, Wash.

Filed Apr. 14, 1983, Ser. No. 484,859

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—288.3 **12 Claims**



1. A ball and socket mount for a component for an optical sensing system such as a source and/or detector device comprising:

a ball affixed to the component to be mounted, said ball having a circumferential groove; and,

a collar surrounding said ball, said collar including a pair of spaced apart, parallel holes suitable for receiving mounting bolts, said holes positioned such that said circumferential groove in said ball can be aligned with said holes so as to allow said mounting bolts to pass through a portion of said groove as well as said holes.

4,515,337

SELF-LEVELING VEHICLE SEAT MOUNT

Robert M. Torras, Brunswick, Ga., assignor to Kut-Kwick Corporation, Brunswick, Ga.

Filed Jun. 17, 1982, Ser. No. 378,632

Int. Cl.³ A47G *29/00*

U.S. Cl. 248—371 **15 Claims**

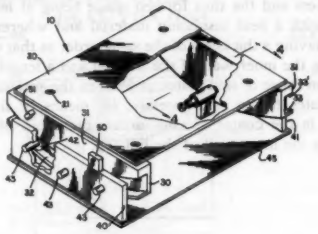
1. A self-leveling seat support for a vehicle, comprising:

a seat platform for supporting a seat member;

mounting means supported on the vehicle and having a first set of surfaces extending across the length of the vehicle;

said seat platform having a second set of surfaces extending across the length of the vehicle in confronting relation with the first set of surfaces, so that the confronting surfaces allow the seat platform to move in only one plane with respect to the mounting means;

means defining an arcuate open-ended track on one of said confronting surfaces;



a plurality of support elements disposed on the other of said confronting surfaces and engaging said arcuate track, so that said seat support platform is movably supported by said support elements and said arcuate track for angular movement in said one plane relative to said mounting means; and

said open ends of said track allowing some of said supporting elements to move off and on the track as the seat platform undergoes said angular movement relative to the mounting means, so that the maximum range of available angular movement is not limited by the length of the track.

4,515,338

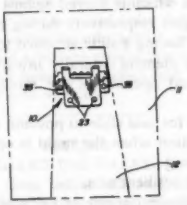
COMBINATION EASEL HINGE AND HANGING DEVICE

Marshall Schneider, Newton Highlands, Mass., assignor to Hallmark Cards, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 369,981, Apr. 19, 1982, abandoned. This application Dec. 15, 1982, Ser. No. 450,120

Int. Cl.³ A47B *97/04*

U.S. Cl. 248—460 **16 Claims**



1. An article support device comprising two detachably engageable components which when assembled in engaged position are adapted for supporting a framed article on a horizontal surface in an easel-type display arrangement, a first component being adapted for attachment to an easel stand and being comprised of a bracket portion having mounting apertures therein and a generally cylindrical shaft element attached thereto, a second component being adapted for attachment to the back of a frame for retaining an article to be displayed and being adapted for use by itself as a hanging device for a framed article or in engagement with said first component to form an easel-type support device, said second component having a generally flat base having mounting apertures therein and a mantle element spaced from and overhanging the top portion of said base, said mantle element being provided with a longitudinal bearing therein for receiving the cylindrical shaft element on said first component and having a saw-toothed hanger portion for engagement on a surface projection.

4,515,339

HEIGHT ADJUSTMENT ARRANGEMENT FOR SEATS, PARTICULARLY MOTOR VEHICLE SEATS

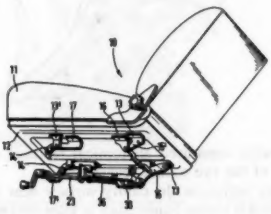
Bernd Klüting, Radevormwald, and Bernd Engels, Remscheid, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG., Remschied, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,097

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046886

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—543 **6 Claims**



1. A height adjustment arrangement for a seat, particularly a motor vehicle seat with a seat portion raisable and lowerably relative to a vehicle floor and having a frame and a longitudinal side, the arrangement comprising

a guide track device fixable on the vehicle floor and having a track runway;

a plurality of pivotable supports, each having one end portion arranged at a fixed height relative to a vehicle floor and another end portion hingedly connectable with a seat portion, each of said supports having an upper end and a lower end;

means for moving said pivotable supports and including a rotatable threaded spindle and a non-rotatable nut engaging with said spindle;

a plurality of pairs of separate supporting elements including a first supporting element pivotally connected with said upper end of each of said supports and mounted on said seat portion and a second supporting element pivotally connected with said lower end of each of said supports and arranged at a fixed height relative to the vehicle floor, said second supporting elements being mounted on said track runway of said guide track device, said first and second seat supporting elements being formed as first and second angular supporting claws, respectively, said first supporting claws being pivotally mounted on one end of the respective pivotable supports and connectable with the frame of the seat portion, said second supporting claws supporting said pivotable supports and being mountable on the track runways of the guide track; and

a bearing block connected with said second supporting claws, said threaded spindle being axially immovably retained on the longitudinal side of the seat in said bearing block.

4,515,340

TAXIDERMY MANNIKIN MOLD WITH RECESSES FOR SUPPORTING ARTIFICIAL EYES

John R. Rinehart, 3232 McCormick Dr., Janesville, Wis. 53545

Division of Ser. No. 363,263, Mar. 29, 1982, Pat. No. 4,432,919. This application Jan. 12, 1984, Ser. No. 570,227

Int. Cl.³ B29D *27/04, 3/00*; B22D *19/04*

U.S. Cl. 249—96 **3 Claims**

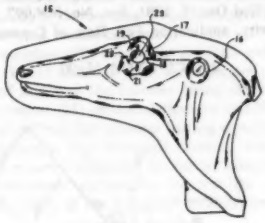
1. A mold for forming a taxidermy animal head mannikin

with artificial eyes molded therein in proper position, comprising:

a pair of mold cavity half parts, each of the half parts having:

a cavity surface contoured for correct anatomical formation of features of half of the mannikin including the features immediately surrounding the eye;

a semi-spherical eye socket recess in the cavity surface shaped for snugly receiving the front portion of an artificial eye and leaving the rear portion projecting into the mold cavity with the surface of the mold cavity having



correctly contoured anatomical features right up to the edge of the eye socket recess; and

reference indicia in the cavity surface near the edge of the eye socket recess comprising at least two indicia markings on opposite sides of the eye socket recess, whereby an artificial eye may be inserted in the eye socket recess and correctly positioned by aligning the pupil of the eye with the indicia markings prior to introducing liquid foamable hardenable material into the cavity between the mold half parts.

4,515,341

INGOT MOULD HAVING A HOT-TOP INSIDE THE UPPER PART OF THE MOULD

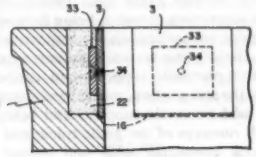
Enn Vallak, and Hannes Vallak, both of Geneva, Switzerland, assignors to International Ferrox Co., Establishment, Vaduz, Liechtenstein

Division of Ser. No. 285,112, filed as PCT EP 80/00131, Nov. 11, 1980, published as WO 81/01377, May 28, 1981, § 102(e) date Jul. 10, 1981, abandoned. This application Jul. 14, 1983, Ser. No. 513,743

Claims priority, application United Kingdom, Nov. 13, 1979, 7939186; Mar. 13, 1980, 8008629

Int. Cl.³ B22D *7/10*

U.S. Cl. 249—106 **18 Claims**



1. An ingot mould comprising a hot-top positioned inside the upper part of the mould, wherein said hot-top comprises an inner wall formed by a plurality of plates made of a material selected from the group consisting of graphite and metallic materials capable of withstanding contact with a molten metal poured into the ingot mould, without being melted or fused, the thickness of said plates being less than that of the wall of the mould, the plates being capable of expanding at a higher rate than the wall of the mould due to the heat of poured molten metal, a plurality of recesses being provided inside the upper part of the mould, said recesses extending over the parts of relatively large radius of curvature, of the wall of the mould, and being separated from each other by the parts of relatively small radius of curvature of the wall of the mould, and each of said plates being disposed in a corresponding recess, with its inner surface being flush and aligned with the corresponding part of the inner surface of the mould, said plates being laterally maintained in contact with the parts of the mould separating the recesses from each other, the outer surface of each plate being spaced from the confronting surface of the corresponding recess and the thus formed space being at least partially filled with a heat insulating material and wherein a further plate, having a thickness of the same order as that of the plates forming the inner wall of the hot-top and a length and width less than those of said plates, is fixed to the surface of each of said plates facing said recesses, by means of fixing means placed in the center of said further plate and of each plate forming the inner wall of the hot-top.

4,515,342

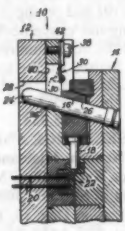
SLIDE RETAINER

Borislav Boskovic, 2102 Bannockburn, Inverness, Ill. 60067

Filed Apr. 6, 1984, Ser. No. 597,719

Int. Cl.³ B29C *1/00*; B29F *1/022*

U.S. Cl. 249—122 **17 Claims**



1. In a mold having a normally stationary mold part and a mating mold part which is moved against and apart from the stationary mold part respectively during closing and opening of the mold, and having a slide attached to a core element for moving the core element laterally inwardly and outwardly during closing and opening of the mold, the improvement comprising

a. retainer means for said slide to position said slide in a laterally offset position when the mold is opened, said retainer means comprising

i. an elongated, resilient arm,

ii. a retention element at one end of said arm, and

iii. means securing said arm to said stationary mold part with said retention element proximate said slide and in the path of said slide as said slide moves outwardly during opening of the mold, and

b. means in said slide engaging said slide retention element to hold said slide laterally outwardly when the mold is opened.

12. A retainer for a slide of a mold having two mating mold parts and a slide for moving a core element laterally inwardly and outwardly during closing and opening of the mold, the retainer being positioned to hold the slide in a laterally offset position when the mold is opened and comprising,

a. an elongated, resilient arm,

b. a retention element at one end of said arm,

c. an aperture through the other end of said arm, and

d. means passing through said aperture securing said arm to one of said mold parts.

4,515,343

ARRANGEMENT FOR ELECTROMAGNETICALLY OPERATED ACTUATORS

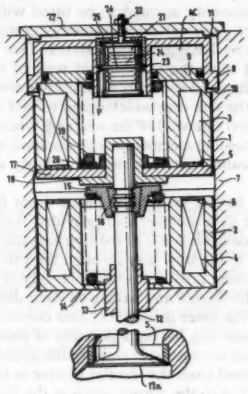
Franz Pischinger, and Peter Kreuter, both of Aachen, Fed. Rep. of Germany, assignors to Fev Forschungsgesellschaft für Energietechnik und ver Brennungsmotoren mbH, Aachen, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,121

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1983, 3311280; Mar. 28, 1983, 3311250

Int. Cl.³ F16K *31/04*

U.S. Cl. 251—48 **23 Claims**



1. An arrangement for an electromagnetically operated actuator for a displacement type engine having a spring-mass valve actuating oscillatory system which includes a valve operable relative to its valve seat within a housing, an armature connected to said valve, a pair of electromagnets on opposite sides of said armature for maintaining said valve in at least first and second final operational positions of the maximum amplitude of vibration, dampening means comprising said armature and at least one of said electromagnets, a hydraulic length-compensating element for mounting said one electromagnet on said housing for adjusting the distance between said valve seat and the pole area of said one electromagnet so that it corresponds to the distance between said valve head and the pole face of said armature, whereby substantially consistent dampening is effected as said armature approaches said one electromagnet and said valve head approaches said valve seat both with substantially the safe velocity.

4,515,344

BLOCKING VALVE

Francois Gémignani, Zone Industrielle la Palunette, Bouches-du-Rhone, Chateauneuf les Martigues, France

Filed Jan. 22, 1982, Ser. No. 341,829

Claims priority, application France, Feb. 17, 1981, 81 03481

Int. Cl.³ F16K *31/122*

U.S. Cl. 251—635 **6 Claims**

1. A high-pressure valve for isolating a portion of a fluid path, comprising:

a two-part valve body formed in a first part with a passage connectable in said fluid path and provided between opposite sides of said passage with a valve seat, a bore defined by both parts of said body and aligned with said seat, and means for tightening said parts together;

a guide sleeve received in said bore;

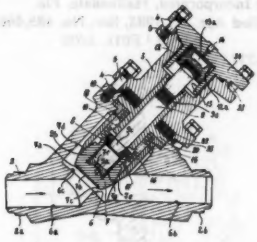
a valve rod axially shiftable and guided in said sleeve for displacement toward and away from said seat;

a valve member juxtaposed with and engageable with said seat at one end of said rod;

a control piston in either one of said parts acting upon an opposite end of said rod and displaceable in a cylinder formed in said other part of said body said valve member having a cross section greater than the cross section of said rod;

a bellows surrounding said rod and secured to said valve member at a face therof turned away from said seat at one end of said bellows while being retained fixedly with respect to said sleeve at another end of said bellows;

a tubular element received in said body coaxially surrounding said body at least at an end thereof connected to said valve member and surrounding said bellows to form an



abutment engaging said valve member in a retracted position thereof to stabilize same against forces applied to said valve member by fluid traversing said passage in said open position of said valve member wherein direct flow of fluid is permitted through said seat along said passage in said open position; and

means including annular flanges braced against a stack of thermally insulating annular gaskets for sealing said parts of said body together and to said sleeve upon operation of said means for tightening while providing a thermal barrier along said sleeve.

4,515,345

SOLENOID VALVE

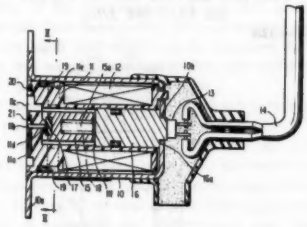
Masahiro Inden, and Kazutaka Kuwana, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 27, 1983, Ser. No. 545,978

Claims priority, application Japan, Oct. 27, 1982, 57-162807[U]

Int. Cl.³ F16K *31/02*; H01F *3/00*

U.S. Cl. 251—141 **3 Claims**



1. In a solenoid valve comprising:

a cup-shaped housing,

a bobbin disposed in the housing and having a coil wound thereon,

a core firmly fixed in the bobbin,

a plunger provided with a valve at one end thereof moveably disposed in said housing,

a flange on one end of said bobbin and having a valve seat disposed so as to be opposite to the valve of the plunger,

a spring biasing the plunger in such a direction as to abut on the valve seat, and

a yoke disposed intermediate said coil and said flange to couple the housing to the plunger magnetically,

the improvement wherein said yoke is divided into a plurality of sections substantially surrounding said bobbin, and wherein said valve seat and said flange are molded integrally with said bobbin.

4,515,346

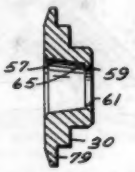
VALVE SPRING RETAINER ASSEMBLY

William C. Gaterman, III, Fort Lauderdale, Fla., assignor to Crane Cams Incorporated, Hallandale, Fla.

Filed Apr. 15, 1983, Ser. No. 485,466

Int. Cl.³ F01L *3/00*

U.S. Cl. 251—337 **8 Claims**



1. A valve spring retainer assembly comprising:

a valve stem for reciprocation with respect to an engine head;

a valve spring positioned about said valve stem;

a keeper fixed with respect to said valve stem and having a fustro-conical outer surface;

a retainer positioned between said keeper and said valve spring about said stem,

said retainer having at least one surface for engaging and retaining said spring, a conical inner surface for mating engagement with said keeper, and an integrally formed locking portion positioned below said keeper, said locking portion extending inwardly toward said valve stem below said keeper for preventing the extrusion of said keeper through said retainer.

4,515,347

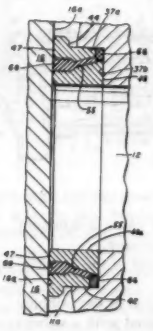
VALVE SEAT STRUCTURE

Willard J. Sitton, and William L. Whaley, both of Houston, Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 27, 1982, Ser. No. 453,845

Int. Cl.³ F16K *3/02*

U.S. Cl. 251—328 **4 Claims**



1. In a gate valve structure comprising a valve body with a valve chamber and inlet and outlet flow passages communicating with the valve chamber and defining a flow way through the valve body, a gate member mounted in the valve body for movement between open and closed positions relative to said flow passages, and a pair of internal annular recesses opening to the valve chamber with one of said recesses in concentric surrounding relation to the inlet flow passage and the other of said recesses in concentric surrounding relation to the outlet flow passage, each said recess being defined by an annular bottom end wall residing in a plane disposed substantially radially of the axis of the flow passage and a circumferential cylindrical side wall;

a valve seat assembly adapted to be fitted within either of said recesses, each valve seat assembly comprising a metallic seat ring having an annular rear face for abutting engagement with the bottom end wall of the recess in which it is disposed and an annular corner notch formed at the rear of the seat ring which opens to said rear face and the cylindrical side wall of the seat ring whereby an annular resilient sealing member may be disposed in said corner notch for sealing between the valve body and said seat ring;

said seat ring having an annular planar front face disposed towards the gate member and provided with an annular groove in coaxial relation to the ring axis and in surrounding relation to the flow way through the valve, said annular groove being provided with a plurality of serrations in the side walls thereof and having an inner diameter which is less than the inner diameter of said corner notch;

said metallic seat ring having a plurality of passages formed therein which are spaced in equiangular relation about the ring and extend from the annular groove in the front face of the seat ring to the corner notch at the rear of the seat ring, said passages and said annular groove being filled with a single mass of elastomer sealing element which is molded within the walls of said annular groove and said passages and adhesive bonded throughout the area extent of said groove and passages, said elastomer sealing element being formed at the front face of the seat ring to provide an annular projection with a rounded surface which projects slightly beyond the front face of the seat ring towards said gate member, said annular face groove of the seat ring having a widened opening at the face of the seat ring as defined by a pair of annular bevelled surfaces at the two sides of the annular groove whereby said elastomer sealing element is adapted to provide a fluid-tight seal with the gate member when said annular projection is compressed by the gate member in the open and closed conditions of the gate member and the deformed elastomer material provided by the compression of its annular face projection is accommodated by the widened opening of the annular face groove to thereby enhance its resistance to abrasion by the gate member.

4,515,348

SKIN STAPLE EXTRACTOR

Joseph W. Blake, 88 Main St., New Canaan, Conn. 06840

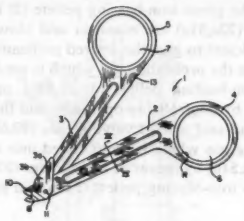
Filed Oct. 15, 1981, Ser. No. 311,882

Int. Cl.³ B25C *11/00*

U.S. Cl. 254—28 **8 Claims**

1. A manually operable extractor for surgical staples, comprising a first handle element having a first rear portion provided with a finger-receiving ring end, and a first front portion having a bifurcated forward end, said bifurcated forward end comprising first and second extensions of said first portion in overlapping parallel relationship to each other and separated by a space therebetween, a bight section joining said first and second extensions along one side thereof and extending parallel to a longitudinal edge of said first handle portion whereby said first and second extensions and said bight section define a U-shaped channel, said first and second extensions terminating in a pair of elongated anvil sections in parallel spaced relationship, said anvil sections having rearward ends with notches,

and steep upwardly and rearwardly sloping edges from said notches to said bight section thereby defining a slot between said anvil sections; a second handle element having a second rear portion also provided with a finger-receiving ring end, and a second front portion terminating in a blade section, said second front portion pivotally mounted within said U-shaped channel of said first front portion with said blade section located between and parallel to said anvil sections and movable



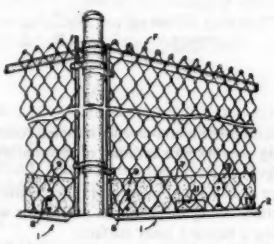
through said slot, said anvil sections being spaced apart throughout their length by a distance greater than the thickness of said blade section; rivet means for pivotably connecting said second handle element to said first handle element within said bifurcated forward end; and said finger-receiving ring ends comprising the sole means for spreading said rear portions of said handle elements apart and for bringing said rear portions toward each other.

4,515,349

INTEGRAL VEGETATION BARRIER

George D. Groves, Jefferson County, Mo., assignor to B. & G. Consultants, Inc., Arnold, Mo.

Filed Dec. 27, 1983, Ser. No. 565,410
Int. Cl.³ E04H *17/06*
U.S. Cl. 256—1 **8 Claims**



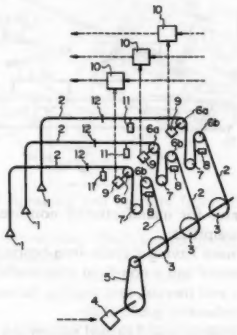
1. An integral fence associated vegetation barrier for eliminating the growth of grass, weeds, or the like, in the vicinity of the lower edges of fencing, comprising a base member designed to locate under the lower edge of such fencing and upon the ground and said base member having a width for extending laterally to either side of the fence to allow clearance for any lawn mower or other cutter to at least partially override thereon during lawn trimming, an upstanding leg integrally formed approximately near the upper center of the base member and extending upwardly for a distance to allow its fixation of the fence, said upstanding leg having at least one apperture provided therethrough to facilitate its tying of the said barrier to any associated fence.

4,515,350

SIMULTANEOUS MULTI-POINT SOUNDING APPARATUS

Yoichi Shibata, Yokohama; Ryosuke Kimura, Tokyo; Takashi Sumigama, Yokohama, and Masaro Izumi, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 273,447, Jun. 15, 1981, abandoned.
This application Nov. 7, 1983, Ser. No. 534,579
Claims priority, application Japan, Jun. 16, 1980, 55-82933[U]
Int. Cl.³ C21B *7/24*
U.S. Cl. 266—92 **5 Claims**



1. A simultaneous multiple points sounding apparatus comprising

a plurality of weights to be suspended above burden charged in a furnace;

a plurality of wire ropes attached to respective ones of said weights at one end thereof and extending at the other end thereof outside of said furnace;

a plurality of drums disposed outside of said furnace for coiling respective ones of said plurality of wire ropes;

a single driving device connectable to said plurality of drums for concurrently driving said plurality of drums;

a plurality of first pulleys, each fixedly in a position between said furnace and said drums;

a plurality of second pulleys, each fixedly in a position between said first pulley and said drums;

a plurality of third pulleys, each movably positioned between said first fixed pulley and said second fixed pulley, whereby each said wire rope is threaded, in order, between said weight, said first pulley, said third pulley, said second pulley and said drum; and

detector means for detecting downward movement of said third pulley;

whereby said plurality of weights are all concurrently wound upon with their respective connected wire ropes to a top position by said single driving device concurrently driving all of said drums, whereupon said driving device is stopped, and whereupon said plurality of weights are subsequently allowed to travel downwardly until one or more thereof hits a charged burden, whereupon the respective connected wire rope has tension thereon lessened temporarily and the rotation of said respective first pulley is concurrently stopped and said respective third pulley connected thereto thereupon travels downward to make up the lessened tension on said wire rope; said downward movement of said third pulley is then detected by said detector means, thereby to indicate the dispersion of said burden within said furnace.

4,515,351
METHOD AND APPARATUS FOR MANUFACTURING NON-FIRED IRON-BEARING PELLET

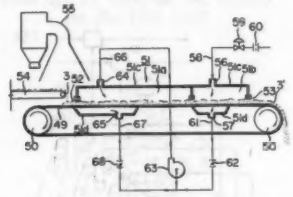
Michio Nakayama, Kawasaki; Osamu Tajima, Kamakura; Seiji Matsui, Kawasaki; Hideyuki Yoshikoshi, Hino, and Hiroshi Fukuyo, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 366,199, Apr. 7, 1982, Pat. No. 4,432,788. This application Dec. 6, 1983, Ser. No. 558,758

Claims priority, application Japan, Apr. 23, 1981, 56-60640; Apr. 23, 1981, 56-60641

Int. Cl.³ C22B *1/08*

U.S. Cl. 266—177 **3 Claims**



1. An apparatus for manufacturing non-fired iron-bearing pellets which comprises:

a treating furnace having a green iron-bearing pellet inlet at one end thereof and a non-fired iron-bearing pellet outlet at the other end thereof, said treating furnace comprising:

a source of preheating gas;

a preheating zone coupled to said preheating gas source for preheating green iron-bearing pellets which are continuously supplied from said green iron-bearing pellet inlet into said treating furnace to a temperature of from 40° to 90° C.;

a source of heating gas;

a heating zone following said preheating zone and coupled to said heating gas source, for heating the thus preheated green iron-bearing pellets by means of said heating gas which contains saturated steam under atmospheric pressure and has a temperature of from 50° to 100° C., said heating gas converting said green iron-bearing pellets into non-fired iron-bearing pellets, the green iron-bearing supplied from said green iron-bearing pellet inlet into said treating furnace passing sequentially and continuously through said preheating zone and said heating zone;

said preheating zone comprising a preheating gas blowing port through which said preheating gas is blown into said preheating zone to thereby preheat the green iron-bearing pellets therein, and a preheating gas discharge port through which said preheating gas after the completion of said preheating of the green iron-bearing pellets in said preheating zone is discharged;

said heating zone having a heating gas blowing port through which said heating gas is blown into said heating zone to heat the green iron-bearing pellets therein, and a heating gas dischrge port through which said heating gas after the completion of said heating of the green iron-bearing pellets in said heating zone is discharged;

means for blowing said heating gas from said heating gas blowing port into said heating zone of said treating furnace; and

a blower (**37,63**) for blowing said preheating gas from said preheating gas blowing port into said preheating zone of said treating furnace, said blower having a suction port and a blowing port;

means including a first valve means (**36,62**) coupling and communicating said suction port of said blower (**37,63**) with said heating gas discharge port (**29,57**) of said heating zone (**22*b*,53*b*);

means including a second valve means (**40,68**) coupling and communicating said suction port of said blower (**37,63**) with said preheating gas discharge port (**31,65**) of said preheating zone (**22*a*,51*a*); and

means for communicating said blowing port of said blower (**37,63**) with said preheating gas blowing port (**30,64**) of said preheating zone (**22*a*,51*a*);

whereby said heating gas which had been used to heat the green iron-bearing pellets (**3**) in said heating zone (**22*b*,51*b*) and said preheating gas which had been used to preheat the green iron-bearing pellete (**3**) in said preheating zone (**22*a*,51*a*) are mixed in said blower (**37,63**) at a ratio sufficient to give the desired preheating temperature to prepare the preheating gas which is used to preheat the green iron-bearing pellets (**3**) in said preheating zone (**22*a*,51*a*) by controllably operating said first valve means (**36,62**) and said second valve means (**40,68**) to form said preheating gas which is recirculated into said preheating zone (**22*a*,51*a*) by means of said blower (**37,63**) to preheat the greeb iron-bearing pellets (**3**) in said preheating zone (**22*a*,51*a*).

4,515,352
ROTARY FURNACE USED FOR THE PRODUCTION OF FERROCHROMIUM

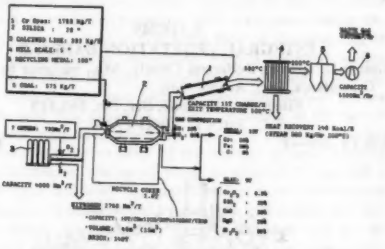
Tsutomu Fukushima; Kiyoshi Kawasaki, and Sadayuki Sasaki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 403,049, Jul. 29, 1982, Pat. No. 4,414,026. This application Aug. 3, 1983, Ser. No. 519,901

Claims priority, application Japan, Jul. 30, 1981, 56-118500; Jul. 31, 1981, 56-119291

Int. Cl.³ C21C *5/48*

U.S. Cl. 266—218 **8 Claims**



1. A horizontal or a non-steeply inclined rotary furnace used for smelting reduction or refining of metal alloys, said furnace comprising:

a furnace shell having inner and outer walls;

a refractory lining disposed on said inner wall, said lining defining a furnace inner surface;

a plurality of openings arranged in spaced relation on the circumference of the furnace outer wall, said openings extending through said furnace shell and said refractory lining, thereby defining a corresponding plurality of openings on the furnace inner surface;

said furnace defining an upper zone and lower zone during rotation, said upper zone being a free-space zone devoid of material at all times, and said lower zone comprising metal, slag, reducing agents and other materials; and

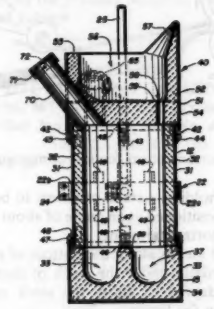
each of said openings communicating with a source of fuel or fuel-oxygen mixture during the melting period in which the ores and other materials in the furnace are melted for yielding metal and slag, said fuel or fuel mix being introduced into said lower zone, thereby promoting the smelting of the raw materials.

4,515,353

TUNDISH COVER FOR DUCTILE IRON TREATMENT

Gerry E. Isenberg, Cassville; Terry L. Forshey, Calvin, and Robert D. Keller, Jr., Belleville, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Division of Ser. No. 478,393, Mar. 24, 1983, Pat. No. 4,488,711.
This application Jul. 16, 1984, Ser. No. 631,286
Int. Cl.[3] C21C *1/06*
U.S. Cl. 266—236 17 Claims



1. A tundish cover engagable with a treating ladle to control the emission of exhaust gases from the treating ladle during operation thereof comprising:

a lid portion engagable with said treating ladle;

a receiving box mounted on said lid portion to form a generally open-topped basin receptacle, said receiving box having an orifice therein and extending through said lid portion to permit the introduction of molten iron into said treating ladle and the removal of treated iron from within said treating ladle;

a pressure exhaust port formed in said lid portion to permit a controlled escape of exhaust gases from said treating ladle through said lid portion; and

a charging tube forming a passageway through said lid portion for the introduction of a treatment alloy into the treating ladle without effecting a removal of said lid portion from said treating ladle, said charging tube having a removable cover to prevent the escape of exhaust gases from said charging tube, yet permit the selective introduction of treatment alloy into the treating ladle.

4,515,354

FIXTURE FOR ASSEMBLING PINS INTO A SHUTTLE

Donald E. Chandler, Colonial Heights; William M. Chisholm, Midlothian, and Ralph T. Lechner, Richmond, all of Va., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,717
Int. Cl.[3] B23Q *3/00*
U.S. Cl. 269—15 3 Claims

1. A fixture for facilitating the assembly of end-carried terminal pins into a shuttle having securing means for securing terminal pins within the shuttle upon actuation of the securing means, comprising:

a work surface;

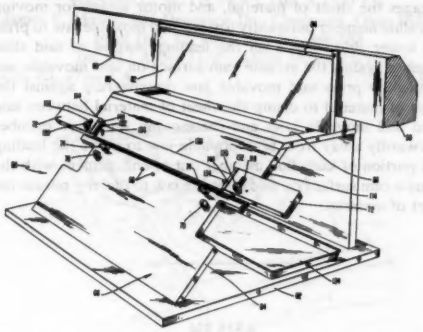
a locking bar slidably mounted on the work surface for limited movement in a path toward and away from the shuttle on the work surface, and for actuation of the securing means upon movement toward the shuttle;

at least two lateral locating pins on the fixture arranged to engage two surfaces of recesses in the shuttle to limit movement of the shuttle in a direction perpendicular to the path of movement of the locking bar;

at least one orthogonal locating pin on the fixture to engage at least one surface within a recess of the shuttle to limit movement of the shuttle in a direction parallel with the path of movement of the locking bar;

a plurality of hold-down clips for engaging a hold-down groove of the shuttle;

a terminal-pin-holding tray mounted with respect to the work surface;



a groove for breaking end carriers from shuttle-mounted pins; and

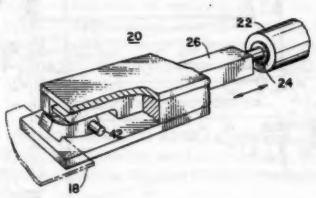
a pin-end-carrier-receiver chute located under the end-carrier-breaking groove.

4,515,355

SHEET METAL WORKHOLDER UTILIZING LINEAR WEDGE ACTION

James R. Hunter, Chadds Ford, Pa., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,150
Int. Cl.[3] B23Q *3/18*
U.S. Cl. 269—234 1 Claim



1. A clamp assembly for holding a sheet of material during operation of a machine tool, said clamp assembly comprising a box structure having parallel upper and lower walls and a pair of parallel side walls extending between the upper and lower walls, said lower wall of said box structure having an outer end portion which forms a fixed jaw engageable with a lower side surface of the sheet of material, a movable jaw, means for pivotally mounting said movable jaw on the side walls of said box structure, said movable jaw having an outer end portion with a lower side which engages an upper side of the sheet of material at a location above said fixed jaw, said outer end portion of said movable jaw having an upper side with an arcuate cam surface which curves upwardly to a location above where the outer end portion of the movable jaw engages the sheet of material, a reciprocatable slide member disposed within said box structure, said slide member having flat parallel upper and lower surfaces disposed in abutting engagement with inner side surfaces of said upper and lower walls of said box structure and having flat parallel side surfaces disposed in abutting engagement with inner side surfaces of said side walls of said box structure, said slide member having a leading end portion with an upper side surface disposed in abutting engagement with the upper wall of said box structure and having a

lower side surface which is spaced from the lower wall of said box structure and faces downwardly toward the lower wall of said box structure, said lower side surface on the leading end portion of said slide member being movable into abutting engagement with said arcuate cam surface on the upper side of said movable jaw at a location above where said fixed jaw engages the sheet of material, and motor means for moving said slide member outwardly toward said movable jaw to press the lower side surface on the leading portion of said slide member against the arcuate cam surface on said movable jaw to thereby press said movable jaw downwardly against the sheet of material to clamp the sheet of material between said fixed and movable jaws and for moving said slide member rearwardly away from said movable jaw to move the leading end portion of said slide member out of engagement with the arcuate cam surface on said movable jaw to thereby release the sheet of material.

4,515,356

SPRING BIASED CRANK ARM DRIVE FOR TRAY MOUNTED STAPLER

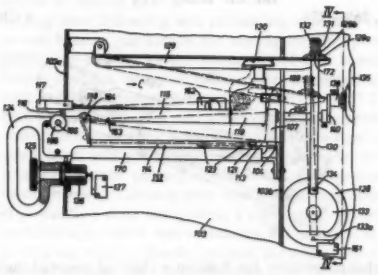
Ludwig Müllritter, Munich; Günther Schnall, Eching, and Franz Fruth, Germering, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,531

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304875

Int. Cl.³ B42B *1/02*

U.S. Cl. 270—53 **6 Claims**



1. A copy-receiving device for receiving copies in a copying machine, comprising a copy-receiving table connected to the copying machine and receiving therefrom a continuous succession of copies and including at least one copy-receiving plate on which sets of copies to be stapled are collected, said plate being inclined to a horizontal at a predetermined angle; a stapling device insertable into said table to staple the copies in the set on said plate together; means for actuating said stapling device, said actuating means comprising a drive motor, a crank drive connected to said motor, a compression spring on said crank drive, and an actuating arm cooperating with the stapling device to actuate the latter, said motor driving said actuating arm via said crank drive under the interposition of said compression spring; and a microswitch cooperating with said crank drive for switching said drive motor off when the crank drive is in a termination position, said crank drive including a crank disc, a crank pin, and an elongated pulling bar, said bar being pivotally connected to said disc by said crank pin, said actuating arm having an end and being formed at said end with a bulge-like projection.

4,515,357

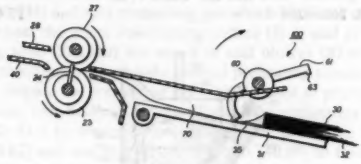
PADDLE RETARD FEEDER

Thomas J. Hamlin, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1982, Ser. No. 446,740

Int. Cl.³ B65H *3/06*

U.S. Cl. 271—120 **13 Claims**



1. An inertia friction retard feeder, comprising in combination:

tray means for holding a stack of sheets to be fed, said tray means being positioned at an angle of about 10° to 15° with respect to a horizontal plane;

friction surfaced means along the bottom of said tray means extending partially under the stack of sheets in said tray means and adapted to allow the stack of sheets to be placed thereon for feeding;

paddle wheel means positioned a predetermined distance in front of the stack and located in driving relation to all sheets in the stack, said paddle wheel means includes a plurality of blades mounted on a hub such that as said paddle wheel is rotated, said blades initially contact the top sheet in the stack in a first position and by inertial separation moves the top sheet in the stack along the stack and away from the other sheets in the stack and in a second position deflects downward in front of the stack to retard multi-feeding of the other sheets from the stack;

registration means for receiving a sheet fed from said stack and deskewing and registering the sheet for subsequent transport; and

negative buckle chamber means adapted to provide an urging force to sheets buckled therein in order to positively position sheet against said registration means.

4,515,358

SHEET FEEDING APPARATUS

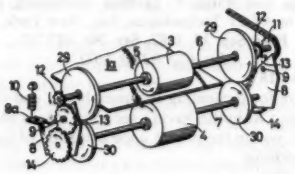
Kazuyuki Fukui, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 8, 1982, Ser. No. 447,770

Claims priority, application Japan, Dec. 21, 1981, 56-207697

Int. Cl.³ B65H *3/52*

U.S. Cl. 271—122 **6 Claims**



1. A sheet feeding apparatus for feeding stacked sheets one by one, comprising:

a prefeed member adapted to act on the uppermost sheet of the stack for feeding the sheet,

a feed roller rotatable in the sheet feeding direction and mounted on a shaft,

a separating roller rotatable in a sheet returning direction and mounted on a shaft,

means for transmitting drive power from opposite ends of the shaft of one of the rollers to opposite ends of the shaft of the other roller, the drive power being delivered to the shaft of said one roller from a drive source,

means for pressing the feed roller and the separating roller into contact with each other, and

disks mounted on the shafts of the two rollers respectively and positionable in contact with each other at their peripheries, the disks being slightly smaller in combined diameter than the rollers, for regulating the contact with each other by the pressing means to a level not higher than a specified value.

4,515,359

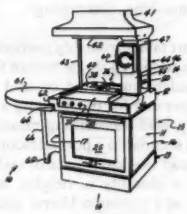
TOY KITCHEN PLAY CENTER

James F. Mariol, 481 Deanview Dr., Cincinnati, Ohio 45224

Filed Jan. 19, 1983, Ser. No. 459,207

Int. Cl.³ A63H *33/30*

U.S. Cl. 272—1 R **4 Claims**



1. A toy kitchen play center device embodied in a compact unitary structure comprising:

a simulated stove, the stove also serving as a base for the kitchen play center, the stove having a top, bottom and sides,

a simulated oven formed in the stove, the oven having an internal cavity and a door for accessing the cavity,

a cabinet/simulated refrigerator formed in the stove having an internal cavity and a door for accessing the cavity,

the oven cavity and cabinet/simulated refrigerator being located in back-to-back relationship in the stove, the door for accessing the oven and the door for accessing the cabinet/simulated refrigerator opening in opposite directions on opposite sides of said stove,

a simulated cooking range, the cooking range located on a portion of the top of the stove,

a simulated kitchen sink, the sink located on another portion of the top of the stove, the sink including simulated plumbing fixtures,

the simulated range and simulated kitchen sink being located on the stove top in substantially back-to-back relationship,

an upright wall panel structure, the wall panel located on yet another portion of the top of the stove,

a simulated telephone, the telephone being mounted on the upright wall panel structure,

a kitchen canopy and simulated ventilation unit extending over the stove top, the kitchen canopy being carried at one end by the wall panel structure and at the other end by a vertical upright extending from the stove top,

a folding table, the folding table being pivotally connected along one side of the stove and pivotable between an upright and open position wherein the table extends substantially perpendicular to the stove side, the table presenting a generally planar upwardly facing table surface in the open position, and a closed position wherein the table extends downwardly and substantially parallel to the stove side, the folding table including a vertically extending support member pivotably connected to the same stove side, the table support in use contacting the underside of the table to thereby support the table in an open and raised position, the table support pivotable between a table support position and a closed and folded position, the support in the closed position being folded against the side of the stove and between the table and the same side.

4,515,360

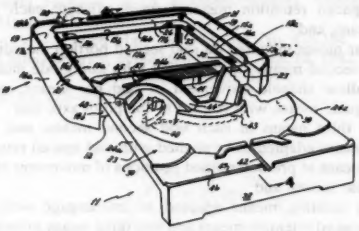
SANDBOX WITH PLAY DECK COVER

James F. Mariol, 481 Deanview Dr., Cincinnati, Ohio 45224

Filed Dec. 12, 1983, Ser. No. 560,553

Int. Cl.³ A63G *31/00;* **A63H** *18/00, 23/16*

U.S. Cl. 272—1 A **6 Claims**



1. A sandbox for recreational play comprising,

a base having upright sidewalls and a bottom, the sidewalls and the bottom forming a container for sand, and

a rigid cover for the container, the cover being slidably received in channels formed in the base sidewalls for movement between a first generally horizontal position wherein the container is covered to a second generally horizontal position wherein the container is uncovered, the cover further including a downwardly depending portion which serves as a support for one end of the cover when in the second position, the opposite end of the cover being supported by the base in the second position such that the cover functions as a play deck for the sandbox when in the second position, said cover having a depression formed therein for receiving water and water toys in both the first and second positions of the cover.

4,515,361

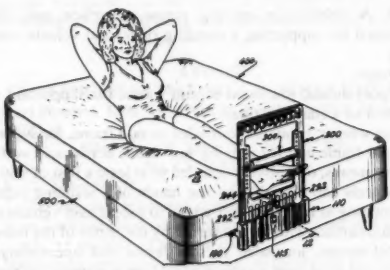
EXERCISING APPLIANCE

Anthony Melillo, Bernardsville, and Louis Gabriele, Livingston, both of N.J., assignors to Michael Codella, Parsippany, N.J., a part interest

Filed Feb. 4, 1983, Ser. No. 463,992

Int. Cl.³ A63B *23/02*

U.S. Cl. 272—93 **20 Claims**



1. An exercising appliance comprising a first generally planar portion and a second generally planar portion, said first and second portions being pivotally connected to one another

at a pivot axis located at respective ends of said portions, said first portion including:

(a) a first means adapted to assist in frictionally retaining said first portion in a substantially fixed position when said first portion is placed in a confined space;

(b) stop means adjacent said pivotally connected end for limiting the movement of said first portion into said confined space to a pre-determined distance; and

(c) slot means formed at an end opposite said pivotally connected end which forms handle means;

said second portion including

(a) guide means on opposed sides thereof;

(b) spaced retention means formed adjacent each guide means, and

(c) bar means mounted on said second portion including:

(i) second means interengaging with said guide means to allow slidable movement of said bar means on said guide means with respect to the pivot axis; and

(ii) third means in each said second means, said third means adapted to be aligned with said spaced retention means at pre-determined positions of movement of said bar means; and

(iii) locating means adapted to interengage with said spaced retention means and said third means to lock said bar means into pre-determined fixed positions.

4,515,362

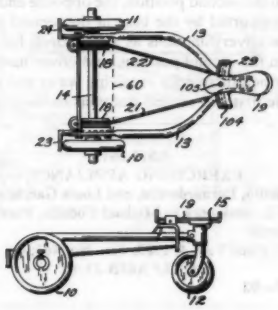
EXERCISE TRICYCLE

Chin-Lung Lin, No. 692, Shan-Hsing-Chiao, Shiang-Shan Shiang, Hsing Chu Hsien, Taiwan

Filed Jun. 11, 1982, Ser. No. 387,749

Int. Cl.³ B62M *1/16*; A63B *23/00*

U.S. Cl. 272—114 **5 Claims**



1. A vehicle for moving across a surface, said vehicle adapted for supporting a standing rider, said vehicle comprising:

a frame;

support means, journaled to said frame, for supporting a first foot of a standing rider;

three wheels, rotatably journaled to said frame, for supporting said frame and for moving said frame across said surface;

drive means, operatively coupled to at least a first of said three wheels and operable by the hands of a standing rider, for rotating at least said first wheel to propel said vehicle across said surface with force exerted by the hands of the rider; and

pedal means, journaled to said frame and operatively connected to at least a second of said three wheels, for supporting the second foot of said standing rider, for controlling the axial orientation of said second wheel with respect to said frame to control the direction in which said vehicle moves across said surface, and for braking said vehicle.

4,515,363

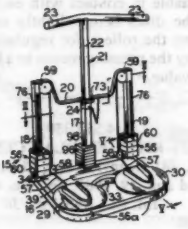
WEIGHT LIFTING EXERCISER

John J. Schleffendorf, 2312 Crescent Ave., Waukegan, Ill. 60084

Filed Mar. 10, 1982, Ser. No. 356,635

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—118 **16 Claims**



1. An exercising machine, comprising:

(a) a base;

(b) a pair of support tables rotatably carried on said base, and each adapted to support a single human foot, respectively;

(c) a vertical standard supported on said base and having means at its upper end for transmitting a reactive force to the human body, said transmitting means including a seat at its upper end secured to a post telescopically and releasably engaging said vertical standard, said post being lockable thereto at a plurality of heights, and said standard being disposed at a common lateral side of said support tables; and

(d) a pair of resistance means supported on said base and respectively independently connected to said support tables for providing a reactive rotary force to support table rotation as each table is moved out of a neutral position.

4,515,364

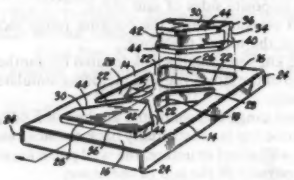
COMPACT EXERCISE DEVICE

Thomas B. Rotella, 22 E. 7th St., Clifton, N.J. 07011

Filed Jul. 7, 1983, Ser. No. 511,472

Int. Cl.³ A63B *11/02, 21/00*

U.S. Cl. 272—143 **20 Claims**



14. In an exercise device:

a frame having at least a frame portion of resilient material;

a lifting handle integral with the frame, the lifting handle having opposite ends and extending from said frame portion;

a resiliently dilatable opening in the frame portion adjacent at least one of the opposite ends of the lifting handle, the opening having a given peripheral configuration; and

a weight having a periphery with a peripheral configuration including at least a portion complementary to a corresponding portion of the peripheral configuration of the opening;

the relative dimensions of the corresponding portions of the opening and the weight being such that the opening will dilate resiliently to admit the weight and will contract

resiliently to interengage the corresponding portions of the weight and the opening and secure the weight within the frame adjacent said one of the opposite ends of the lifting handle for manipulation of the frame and the weight therein.

4,515,365

DEVICE FOR MEASURING SWING DATA OF BASEBALL BAT

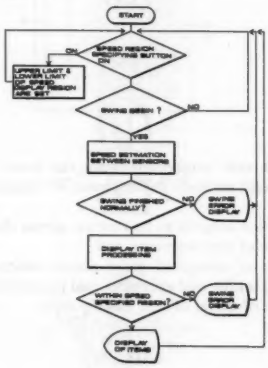
Hiroshi Horikoshi; Akio Arai; Sadayuki Tsukagoshi, and Junichi Sakamoto, all of Gumma, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,456

Claims priority, application Japan, Mar. 23, 1983, 58-41520[U]; Mar. 23, 1983, 58-41522[U]; Mar. 23, 1983, 58-41523[U]; Mar. 23, 1983, 58-41524[U]; Mar. 23, 1983, 58-41525[U]

Int. Cl.³ A63B *71/02*

U.S. Cl. 273—25 **4 Claims**



1. A swing data measuring device wherein swing data of bat swing performed by a baseball player, including level of a swing plane, inclination of the swing plane with respect to the horizontal plane and speed of the bat, is optically detected and the swing data is displayed in digital form, comprising:

a first light emitting/receiving means composed of a first light emitting means for forming a first light beam in approximately vertical direction with respect to the earth and a first light receiving means for receiving a first reflection light beam of the first light beam reflected of the surface of the bat;

a second light emitter/receiving means composed of a second light emitting means for forming a second light beam in parallel to the first light beam and a second light receiving means for receiving a second reflection light beam of the second light beam reflected off the surface of the bat;

a third light emitting/receiving means composed of a third light emitting means for forming a third light beam intersecting the first light beam and a third light receiving means for receiving a third reflection light beam of the third light beam reflected off the surface of the bat;

a fourth light emitting/receiving means composed of a fourth light emitting means for forming a fourth light beam intersecting the second light beam and a fourth light receiving means for receiving a fourth reflection light beam of the fourth light beam reflected off the surface of the bat;

a processing means for processing the swing data based on output signals from the four light receiving means;

a collection means including means for collecting past swing data obtained by swings performed already and means for analyzing the swing data collected;

a display means for displaying the processing result of the processing means and the collection means;

said processing means comprising means for setting lower limit speed and upper limit speed of the bat; and

a cancel means for stopping the measurement of swing data when speed of the bat is outside the speed region between set values of the lower limit speed and the upper limit speed.

4,515,366

SLOT MACHINE WITH PATTERN CONFIRMATION AND CORRECTION MEANS

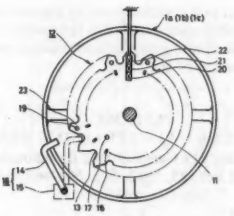
Junichi Hamano, 24-13, Koshienkitamachi, Nishinomiya-Shi, Hyogo 633, Japan

Filed Mar. 23, 1983, Ser. No. 478,186

Claims priority, application Japan, Aug. 12, 1982, 57-140722

Int. Cl.³ A63F *5/04*

U.S. Cl. 273—143 R **12 Claims**



1. A slot machine comprising a plurality of rotary drums on the periphery of which plural frames of patterns are depicted, detecting plates connected to each rotary drum and provided with pattern detecting means whose number corresponds to the number of frames, said detecting plates having grooves, reader means which detect passing of said pattern detecting means during drum rotation, stopping means engaging said grooves in said detecting plates and operable to stop said detecting plates, said stopping means causing reverse rotation of said detecting plate and drum depending on the position of said groove when initially engaged by said stopping means, a control means which counts the output of said reader means and specifies the pattern positioned on a stop line based on the counted value after the drum stops, pattern confirming means on said detecting plates which discriminate the pattern positioned on the stop line at least from the preceding and following frames of patterns when the drum is stopped such that said pattern confirming means detects an increase of said counted value resulting from said reverse rotation of said drum and consequent passing of said pattern detecting means again past said reader means, and correction means providing for correcting said increased counted value in response to said pattern confirming means detecting said increased counted value.

4,515,367

CARD SHUFFLER HAVING A RANDOM EJECTOR

Robert Howard, 1800 NE. 114th St. Penthouse #10, Miami, Fla. 33181

Filed Jan. 14, 1983, Ser. No. 457,959

Int. Cl.³ A63F *1/12*

U.S. Cl. 273—149 R **31 Claims**

1. Playing card apparatus comprising:

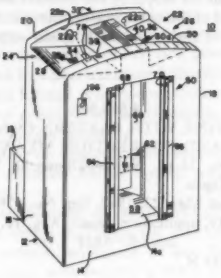
a vertically aligned compartment for receiving and stacking a large number of playing cards;

tray means arranged above said compartment for receiving playing cards to be shuffled;

shuffling means for shuffling playing cards delivered to said shuffling means from said tray means and for delivering shuffled cards downwardly into said compartment;

detection means responsive to emptying of said tray means for generating an output;

pusher means responsive to said output for pushing a portion



of the stack in said compartment to displace said portion a predetermined distance from the remainder of the cards in the stack to facilitate gripping and manual removal of said displaced portion of the stack.

4,515,368

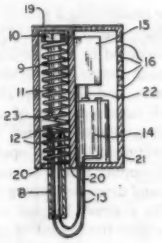
GOLF CLUB SWING TRAINING DEVICE

Donald L. Petitjean, 217 Cardinal Dr., Bloomingdale, Ill. 60108

Filed Feb. 25, 1983, Ser. No. 469,964

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—186 A **3 Claims**



1. A golf club swing training device comprising the combination of a golf club and an attachment therefor, said attachment comprising, housing means attachable to said shaft, electrically operated means within said housing actuated by centrifugal force generated by swinging the club, said electrically operated means having audbile signal emitting means for emitting a continuous audible signal for as long as the club speed achieved during the swing generates a centrifugal force equal to or greater than a predetermined minimum, the housing attachment means being positionable on the club shaft approximately at the swing weight point on the club as determined by a swing weight machine such that there is no substantial change in the swing weight of the club with the device attached.

4,515,369

DICE AND BLACKJACK GAME BOARD

Ernest L. Johnson, Box 44, Fraser, Colo. 80442

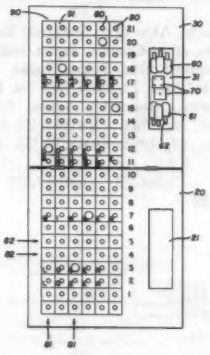
Filed Nov. 22, 1982, Ser. No. 443,706

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—243 **8 Claims**

1. An amusement device comprising a dice and blackjack game board and game pieces comprising:

a game board comprising two rectangular segments that are pivotally connected together, wherein each segment is provided with a plurality of parallel aligned rows of apertures and each row contains eleven apertures, at least one said aligned rows of apertures on each of the segments being provided with consecutive numbering from "one" to "twenty-one", and printed legends associated with the dice game commonly known as "craps" and the card game commonly known as "blackjack" appear adjacent to selected numbers; wherein said printed legends located



adjacent said numbers indicate the result obtained by having said numbers in the games of "craps" and "blackjack";

a pair of dice adapted to be thrown across the length of at least one of said segments; and

a plurality of elongated game pieces dimensioned to be received within said apertures, and to provide obstacles to the path of travel of said thrown dice.

4,515,370

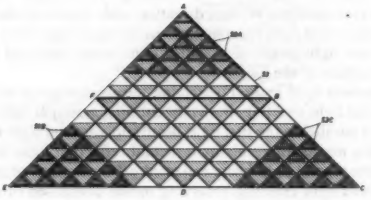
BOARD GAME

Manuel E. Garcia, 3431 Walnut Bend La. #2402, Houston, Tex. 77042

Continuation-in-part of Ser. No. 269,485, Jun. 2, 1981, abandoned. This application Jun. 16, 1983, Ser. No. 505,415

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—258 **19 Claims**



5. A method of playing a board game including opposing sets of triangular-shaped playing pieces and a game board having a plurality of first and a plurality of second triangular areas arranged on said board, with each of said fist triangular areas having its sides parallel to corresponding sides of other of said first triangular areas, each of said second triangular areas having its sides parallel to corresponding sides of other of said second triangular areas, each of said first triangular areas having two or more adjacent first triangular areas and having one or more adjacent second triangular areas, and each of said second triangular areas. having two or more adjacent second triangular areas and having one of more adjacent first triangular areas, said method comprising:

linearly moving a selected one of said playing pieces in a selected direction from one of said first triangular areas to another of said first triangular areas;

linearly moving a selected one of said playing pieces in a selected direction from one of said second triangular areas to another of said second triangular areas;

positioning two of said playing pieces from the same set in adjacent triangular areas for forming a parallelogram-shaped united playing member; and

linearly moving said parallelogram-shaped united playing member independently of said other playing pieces.

4,515,371

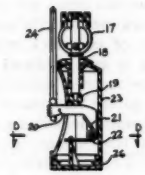
INSTRUCTIONAL CHESS GAME

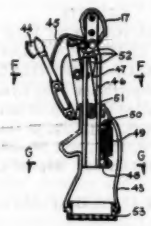
Licinio Basevi, c/o Mr. I. Cesana, 12218 E. Greenwood Ave., Cerritos, Calif. 90701

Filed Jun. 13, 1983, Ser. No. 503,671

Int. Cl.³ A63F *3/02*

U.S. Cl. 273—260 **13 Claims**





1. A chess set comprising an eight by eight pattern of sixty four playing squares on a chess game playing board and two sets of visually distinct playing pieces each comprising eight pawns, two knights, two bishops, two rooks/castles, one queen and one king, said playing board having each of the sixty four playing squares characterised by a centrally situated and substantially square recess of equal size, shape and alignment in all said playing squares, and in cooperative relation with each of the playing pieces, said playing pieces having means such that each playing piece is animated to display and act a diverse bellicose activity appropriate to the character of each type of playpiece by activation by a player-person to cause each distinct play piece when activated to physically attack an opposing playpiece that is to be "taken" during a move of the game; each playpiece further characterised in that the bases of each playing piece and the recesses of each of the playing board playing squares have an interdependent co-operating relationship such that, at least, the bases of the kings, queens, rooks/-castles, bishops and knights playpieces cannot establish the cooperating relationship with any playing squares of the playing board when facing a direction that is unallowable in accordance with the traditional rules of the game of chess, whilst all the bases of the playiing pieces in their inter-dependent relationships with the playing squares are characterised by the centrally situated recesses whereby the base of each of the playing pieces rest on the playing squares' recessed configurations which recessed configurations allow the directional positioning of the playing pieces so that they will establish only correct directional attitudes that the playpieces' representational and activatable animated means may be aimed correctly and only in the directions to which directions the playpieces are permitted to move in accordance with the rules of the game of chess, each play piece animated means being able to physically reach and strike any of the opponent playpieces anywhere about the playing board in accordance with the permitted moves as allowed by the traditional rules of the game of chess.

4,515,372

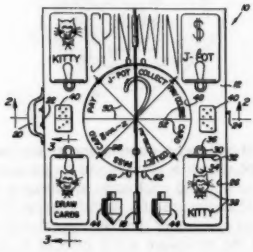
GAME DEVICE

Jose M. G. Gonzales, 8520 Summer, Albuquerque, N. Mex. 87112

Filed Dec. 9, 1982, Ser. No. 448,231

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—274 **8 Claims**



1. A game device comprising a game board having a generally planar upper surface, a centrally disposed, generally circular recess in the planar upper surface defining a compartment with the bottom surface of the compartment being divided into a plurality of radial segments by radial dividing lines with the radial segments being distinguishably colored and provided with indicia and chance control means movably supported in relation to the compartment for designating one of the radial segments of the bottom surface of the compartment, said chance control means including a top type spinner having a tapered lower end and a plurality of flat peripheral surfaces with the number of flat peripheral surfaces corresponding to the number of radial segments formed in the bottom surface of the compartment, the flat surfaces on the spinner including distinguishable colors and indicia corresponding with the colors and indicia on the bottom surface of the compartment, the periphery of the compartment defining a barrier for retaining the spinner therein when it is rotated and spun upon the tapered lower end, said upper surface of the game board also including a plurality of compartments located adjacent the periphery thereof for receiving simulated money or cards having instructional indicia associated therewith, each of said compartments including a lift device for elevating one end of the cards or simulated money placed in the compartments to facilitate access thereto, a pair of standard dice rollable in the compartment for indicating the results of the chance control means, said upper surface of the game board including compartment means receiving the dice for storage, said game board being foldable along a center line and provided with substantial thickness with the hinge axis being at the upper surface of the game board and above the bottom of the compartment whereby the compartment will have an open area when the game board is folded, and a partition forming a closure for the compartment when the game board is folded, said partition including projecting ends having one surface offset inwardly, said compartment having recesses in the periphery thereof along a line parallel to and adjacent the hinge axis for receiving the offset projecting ends for detachably mounting the parti-

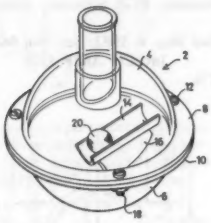
tion across the compartment with one surface thereof aligned with the hinge axis to form a closure for the compartment when the game board is folded.

4,515,373

HAND-HELD BALL GAME

Uri Hirshfeld, Kibbutz Malkia, Israel, assignor to Orda Industries Ltd., Kibbutz Malkia, Israel

Filed Jan. 23, 1984, Ser. No. 572,909
Claims priority, application Israel, Feb. 1, 1983, 67807
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—317 **17 Claims**



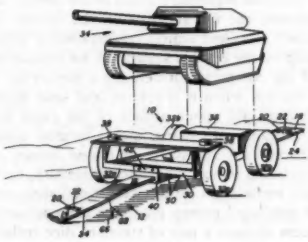
1. A hand-held ball game, comprising: an enclosure, at least the upper end of which is transparent to permit viewing its interior; a ball within said enclosure; an opening through the upper end of said enclosure of a slightly larger diameter than said ball to permit ejection of the ball therethrough by a quick manipulation of the enclosure while held in an upright position; and a channel of substantially semi-cylindrical configuration disposed within said enclosure and constraining the movement of the ball to a line intersected by the longitudinal axis of said opening through the upper end of the enclosure.

4,515,374

MOVEABLE TARGET ASSEMBLY

Thomas W. Herren, Jr., 6611 Dearborn Dr., Falls Church, Va. 22044

Filed Nov. 21, 1983, Ser. No. 553,975
Int. Cl.³ F41J *9/02;* **B61B** *13/04*
U.S. Cl. 273—359 **11 Claims**



1. A moveable target system comprising:

target means for aiding in marksmanship practice including a frame, a target fixed to said frame, front and rear pairs of wheels journalled to said frame for supporting said target above the terrain surface for rolling movement thereacross, and power means for driving said front or rear pairs of wheels to rollingly propel said frame over said terrain surface;

track means for establishing a prescribed course of movement for said target means, said track means including plural elongated flexible track members connected in an end to end manner to establish said course, each of said members defining substantially planar upper and lower surfaces and being flexibly displaceable along said prescribed course between (a) a terrain-engaging position wherein said lower surface of said track means is engaged with said terrain and (b) a displaced position wherein said lower surface is vertically spaced above the terrain surface; and

connecting means fixed to and carried with said frame and defining a cavity vertically spaced above said terrain at a position substantially corresponding to said displaced position of said track means, said cavity for slidably receiving said track means, said conncting means for sequentially flexibly displacing said successive portions of said segments from said terrain-engaging position to said displaced position as said target means is propelled along said prescribed course and for permiting the sequential return of said successive portions from said displaced position to said terrain-engaging position, wherein said track means is flexibly displaced into said displaced position only in the vicinity of said connecting means; and wherein

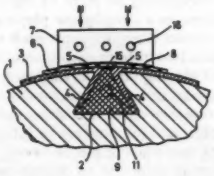
said track means includes plural anchor means axially separated from one another along said prescribed course for anchoring said track means to the terrain and yet permitting said portions of said track means to be upwardly flexibly displaced to said displaced position above said terrain surface.

4,515,375

PROCESS AND ARRANGEMENT FOR SEALING THE GAP BETWEEN THE ENDS OF A GRAVURE PRINTING PLATE MOUNTED ON A PRINTING CYLINDER

Gerhard Bleckmann, Lampertheim; John Lynch, Monsheim, and Heinz Mohr, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,671
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308807
Int. Cl.³ F16J *15/16;* **B41F** *27/06, 27/12*
U.S. Cl. 277—1 **24 Claims**



1. A process for sealing the gap between the ends of a gravure printing plate mounted on a printing cylinder of a sheet-fed or reel-fed rotary gravure printing machine, one or both ends of the gravure-printing plate being folded over and hooked into a groove running parallel to or obliquely to the printing cylinder axis, the process comprising

placing a sheet over the gap and the adjoining two end portions of the surface of the gravure printing plate,

pressing the sheet against the surface of the gravure printing plate so that the gap is covered in a flush manner by the sheet,

filling the resulting gap cavity with a thermoplastic and/or hardenable material,

solidifying the filling material and

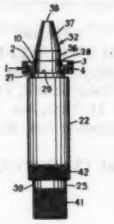
removing the sheet after the filling material has hardened.

4,515,376

SEAL INSTALLATION DEVICE WITH COAXIAL HANDLE PARTS

James A. Okamuro, Kalamazoo, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

Filed Aug. 8, 1984, Ser. No. 639,643
Int. Cl.³ F16J 15/00; B23P 19/02
U.S. Cl. 277—9.5 4 Claims



1. A cup seal installation device, comprising:

an elongate first handle part having means defining a first axially extending hole therethrough;

an elongate second handle part relatively reciprocally mounted in said opening in said first handle part, said first and second handle parts having generally coaxial longitudinal axes;

coupling means for coupling said first and second handle parts together and for limiting the amount of relative reciprocal movement therebetween to first and second limits, said second handle part having first and second portions each extending beyond opposite ends of said first handle part, said first portion having a first outside diameter portion and means defining a second axially extending hole concentric to said first axially extending hole, said first outside diameter portion on said first portion terminating in a first shoulder and a second outside diameter portion larger than said first outside diameter portion, said first shoulder extending beyond the same end of said first handle part as said first portion when said first and second handle parts are oriented at said first limit, said first shoulder being oriented inside said first hole in said first handle part when said first and second handle parts are oriented at said second limit; and

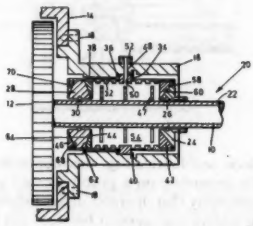
an elongate guide member having a stem at one end thereof removably received in said second hole, said guide member having a second shoulder thereon and an outside surface of larger diameter than said stem and generally equal in diameter to said first outside diameter portion so that a smooth and unobstructed transition surface means exists between said outside surface and said first outside diameter, the end of said guide member remote from said stem having a guide surface converging in a direction away from said stem, whereby said cup seal having a conical lip portion resiliently compressible to a diameter equal to said first outside diameter portion is first oriented so that the capacity of said lip conforms to the converging direction of said guide surface and is then guided onto said guide surface and slid along the length of said guide member to a position snugly encircling said first outside diameter portion to thereby enable said stem of said guide member to be removed from said second hole, the resilient compressibility of said lip portion effecting a snug holding of said cup seal on said first outside diameter portion of said second handle part and to thereby ready said cup seal for installation.

4,515,377

ROTARY SEAL ASSEMBLY HAVING A LIQUID FILLED BELLOWS

Leslie V. Johnson, P.O. Box 34137, Jeppestown 2043, Transvaal, South Africa

Filed Jul. 15, 1983, Ser. No. 514,087
Claims priority, application South Africa, Aug. 6, 1982, 82/5715; Sep. 9, 1982, 82/6622
Int. Cl.³ F16J 15/36, 15/48
U.S. Cl. 277—27 5 Claims



1. A pump seal for a pump used to pump difficult liquids such as slurries and corrosive liquids, the seal in use sealing the shaft of the pump relative to the casing of the pump through which the shaft passes rotatably from the interior to the exterior of the casing which defines, during pumping, a fluid space containing the difficult liquid under pressure, the seal being located within a housing fixed to the casing and surrounding the shaft, and the seal comprising:

first and third annular spaced sealing elements locatable fast with the shaft within the housing and each having a sealing surface;

an axially extensible annular bellows fixed non-rotatably at a point between its ends to the housing, the bellows being spaced radially from and surrounding the shaft to define an annular space between the bellows and shaft;

a second, annular sealing element carried at an end of the bellows away from the fluid space, the second sealing element having a sealing surface complemental in shape to that of the first sealing element and being located adjacent the first sealing element on the side thereof towards the fluid space;

a fourth annular sealing element carried at the opposite end of the bellows towards the fluid space, the fourth sealing element having a sealing surface complemental in shape to that of the third sealing element and being located adjacent the third sealing element on the side thereof away from the fluid space, the first and second sealing elements in combination, and the third and fourth sealing elements in combination defining respective ends of a service liquid compartment existing in the annular space between the bellows and shaft, the bellows resiliently urging the second and fourth sealing elements axially in opposite directions towards the first and third sealing elements respectively; and

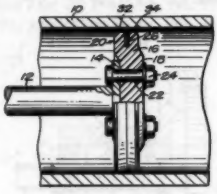
a radial inlet communicating with the interior of the service liquid compartment for the introduction of a fixed volume of pressurized service liquid into the compartment, the pressurized liquid in the compartment forcing the second and fourth sealing elements axially in opposite directions to seal against the first and third sealing elements respectively and creating a service liquid barrier preventing the difficult liquid from entering the service liquid compartment, getting between sealing surfaces of the sealing elements and deteriorating those surfaces.

4,515,378

DOUBLE CUP SEALING MEMBER FOR DOUBLE ACTION PISTON PUMP

Charles R. Marshall, Warwick, R.I., assignor to Dixon Industries Corporation, Bristol, R.I.

Filed May 17, 1984, Ser. No. 611,212
Int. Cl.³ F16J *15/32, 9/08*
U.S. Cl. 277—152 **18 Claims**



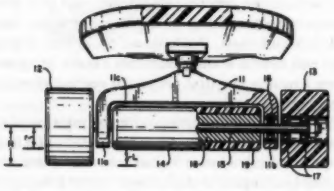
1. A one-piece, self-lubricating, thermoplastic sealing member suitable for mounting on a piston located within a piston and cylinder assembly that operates under differential pressure and providing sealing engagement between the piston and the cylinder in a double action piston pump, said sealing member comprised of an annular shaped body, a peripheral wall portion of which is radially cut into two flexible and resilient flanges of preselected length and thickness, said flanges being substantially in registry with one another, in radial alignment with a transverse axis of said sealing member in an initial position and can be bent in the vicinity of their respective bases in opposite directions from said initial position to a preselected angle below about 20° relative to said transverse axis of said sealing member, said flanges having a memory which urges them to return to their initial prebent position, said sealing member adapted for disposition in an annular space between said piston and said cylinder so that: (1) the peripheral positions of said flanges are placed in continuous contact under tension with the annular surface of the inner walls of said cylinder, providing two discrete sealing engagements therebetween in seriatim, the memory of said flanges causing their peripheral portions to be urged radially against the annular surface of the inner walls of said cylinder so as to continuously compensate for any irregularities of the annular surface of the inner walls of said cylinder and maintain said sealing engagements during reciprocal movement of the piston within the cylinder, and (2) the peripheral portion of said sealing member which is oppositely disposed to said flanges is fixedly secured in said piston.

4,515,379

WHEEL TRUCK AND ROLLER ASSEMBLY

Christian Pasques, P.O. Box 5397, Santa Monica, Calif. 90405

Filed Aug. 5, 1983, Ser. No. 520,545
Int. Cl.³ A63C *17/26*
U.S. Cl. 280—11.27 **6 Claims**



1. A wheel truck and roller assember for a skate platform including:

(a) an axle housing secured to the underside of said platform, said axle housing having left and right legs defining an open channel between the legs;

(b) an axle passing through the legs and across the channel;

(c) left and right skate wheels;

(d) a roller; and

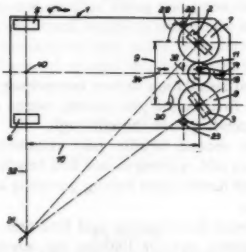
(e) means for mounting said skate wheels and roller in coaxial alignment with the roller between the skate wheels in said open channel and the skate wheels receiving the opposite end portions of the axle extending from the left and right legs respectively of said axle housing, and wherein the roller can rotate independently of the skate wheels.

4,515,380

VEHICLE WITH TWO STEERABLE WHEELS

Karl Schumacher, Tübingen, Fed. Rep. of Germany, assignor to Ernst Wagner KG-Fördertechnik, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,346
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223196
Int. Cl.³ B62D *7/08*
U.S. Cl. 280—93 **7 Claims**



1. A vehicle for travel in a travel direction, comprising:

a frame;

a pair of gears pivotally mounted to said frame on swivel axes at laterally spaced positions with respect to the travel direction, said gears being spaced from each other transversely to the travel direction;

a pinion having a central axis, meshed with each of said gears and disposed in the space between said gears;

a swing arm pivotally connected to said frame at an arm axis and rotatably connected to said pinion at an eccentric axis with respect to said central axis, said arm axis being forward of said eccentric axis in the travel direction;

a steerable wheel rotatably mounted to each gear about a rotation axis which is at an angle to said swivel axis of each respective gear, said swivel axis of each gear extending through a center of a respective steerable wheel;

said swing arm having a longitudinal axis which extends parallel to the travel direction with said rotation axes of each steerable wheel extending transversely to said travel direction for straight ahead travel of the vehicle, said eccentric axis lying in a plane containing said swivel axes of said gears with said longitudinal axis extending parallel to the travel direction, said central axis of said pinion lying rearward of said eccentric axis and in a common plane with said eccentric axis and said arm axis with said longitudinal axis of said swing arm lying parallel to the travel direction when said rotation axes lie transversely to the travel direction, and said central axis of said pinion lying forward of said eccentric axis and in a common plane with said eccentric axis and said arm axis with said longitudinal axis lying parallel to the travel direction when said rotation axes lie at a maximum steering angle to the travel direction; and

drive means engaged with at least one of said gears for rotating said at least one gear to rotate said pair of gears about said swivel axes to steer the vehicle;

said pinion comprising a pair of superimposed pinion parts

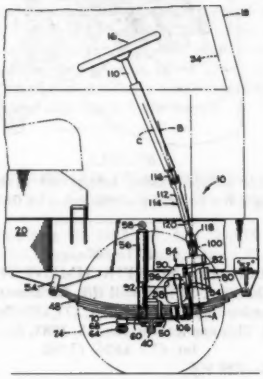
each having teeth which are superimposed to form composite teeth that are meshed with said gears and form composite tooth spaces, and biasing means connected between said pinion parts for biasing said pinion parts to reduce the size of said composite tooth spaces whereby at least one of said composite teeth firmly meshes with each of said gears at any angular position of said pinion.

4,515,381

STEERING CONTROL MECHANISM

Arne N. Gunnarsson, Upland, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 9, 1983, Ser. No. 530,834
Int. Cl.³ B62D *1/20*
U.S. Cl. 280—96 **5 Claims**



1. A steering control system for a vehicle having a narrow cab secured to a chassis connected by springs to an axle having knuckle joints pivoted to the opposite end of the axle with the levers projecting outwardly from the knuckles and pivotally interconnected by a tie rod, and with a steerable wheel journaled on each of said knuckles; the improvement comprising:

a sub-frame rigidly secured to said axle between said wheels and having a front wall extending forwardly of said axle and angled upwardly and rearwardly;

a steering gear box rigidly secured to said front wall at substantially the midpoint between said wheels and spaced forwardly and above said axle, said gear box having an upwardly and rearwardly directed input shaft having a first longitudinal axis angled at about 7° relative to a vertical plane and having an output shaft normal to said input shaft and directed rearwardly of said vehicle;

a steering lever rigidly secured to said output shaft;

a steering arm rigidly secured to one of said knuckles;

a steering rod pivotally connecting said steering lever to said steering arm;

a steering wheel and steering wheel shaft journaled for rotation in said narrow cab and lying in a longitudinal plane at approximately the transverse midplane of said cab and vehicle and having a second longitudinal axis; and

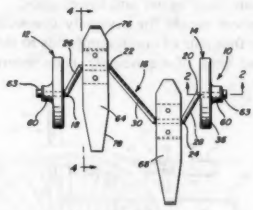
means defining a slip joint having a third longitudinal axis lying in said longitudinal plane and universal joints on opposite ends thereof connecting said steering wheel shaft in driving engagement to said input shaft for steering said wheels in response to turning said steering wheel and for accommodating movement of the chassis axially and transversely of said second axis for minimizing damage to said gear box and minimizing transmission of shock forces to said steering wheel due to driving over rough roads.

4,515,382

OCCUPANT PROPELLED WHEELED DEVICE

Harold L. Boese, Galveston, Tex., assignor to HKC, Inc., Houston, Tex.

Filed Jan. 28, 1983, Ser. No. 462,019
Int. Cl.³ B62M *1/08*
U.S. Cl. 280—221 **3 Claims**



1. A wheeled device comprising two parallel, spaced and aligned wheels, an axle interconnecting said wheels, said axle including a pair of opposed offset portions oriented between axially aligned end portions, and one-way drive connecting means between each of the wheels and the end portions of the axle, an elongated pedal rotatably connected to each of the offset portions of the axle to facilitate an occupant or user balancing himself while moving the offset portions in a circular path to propel the device across a supporting surface said one-way drive connecting means including an axially oriented ratchet mechanism associated with each of the wheels and the corresponding end portion of the axle, each ratchet mechanism including a plurality of ratchet teeth circumferentially arranged on the wheel and facing axially therefrom, a sleeve axially slidable on the axle and spring biased toward the wheel, a pin and slot driving connection between the sleeve and the axle, and a ratchet pawl extending axially from the sleeve for engagement with the teeth on the wheel, wherein said pedals are substantially planar and define forward and rearward end portions relative to the offset portions of said axle, said rearward end portion being substantially longer than said forward end portion and having a transverse end edge for frictionally engaging the supporting surface to provide a drag brake when in contact with the supporting surface, thereby enabling steering control of the device by controlling the downward force exerted on the rearward end portion of each pedal.

4,515,383

WHEELCHAIR CONSTRUCTION

Jeffrey P. Minnebraker, Van Nuys, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.

Continuation of Ser. No. 378,433, May 14, 1982, Pat. No. 4,477,098, which is a continuation-in-part of Ser. No. 206,346, Nov. 13, 1980, Pat. No. 4,351,540. This application May 24, 1984, Ser. No. 613,464
Int. Cl.³ A61G *5/02*
U.S. Cl. 280—242 WC **26 Claims**

1. A wheelchair which is foldable and collapsible for storage and transport and which is openable for use, said wheelchair comprising:

(a) a pair of opposed first and second frame sections,

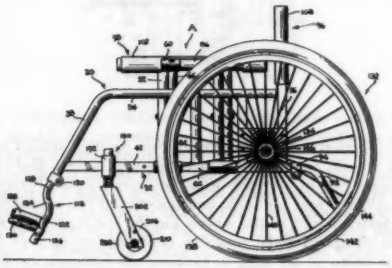
(b) a seat structure connected between said first and second frame sections and each capable of being juxtaposed relative to one another when the wheelchair is in the folded position,

(c) a first pair of spaced apart connecting rods with each pivotally connected to a lower portion of said first frame section at spaced apart locations between the front and rear of the wheelchair, said first pair of connecting rods also being connected to said seat structure at a pair of spaced apart points generally upwardly of the second frame section,

(d) a second pair of spaced apart connecting rods pivotally connected to a lower portion of said second frame section at spaced apart locations between the front and rear of the wheelchair, said second pair of connecting rods also being connected to said seat structure at a pair of points generally upwardly of said first frame section,

(e) first pivot means for pivotally connecting one of the first connecting rods to one of the second connecting rods intermediate their upper and lower ends,

(f) second pivot means for pivotally connecting the other rod of the first pair of connecting rods to the other rod of the second pair of connecting rods intermediate their



upper and lower ends, whereby said frame sections can be shifted apart to the opened position for use and shifted together to the folded position,

(g) first telescoping connecting means located between said pairs of connecting rods between the front and rear of the wheelchair and operatively connecting a side of the seat structure above the first frame section to the first frame section, and

(h) a second telescoping connecting means located between said pairs of connecting rods between the front and rear of the wheelchair and operatively connecting a side of the seat structure above the second frame section to the second frame section.

4,515,384

FRONT WHEEL SUSPENSION SYSTEM FOR A MOTORCYCLE

Kenji Honma; Toshio Asami; Masayuki Baba, all of Saitama, and Sumio Nakayama, Shizuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Showa Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,291

Claims priority, application Japan, Sep. 19, 1981, 56-148029

Int. Cl.³ B60G *17/08;* **B62K** *25/08*

U.S. Cl. 280—276 **12 Claims**

1. A front wheel suspension system for a motorcycle, comprising:

a fork pipe and a bottom case;

an oil pressure generating chamber defined by said fork pipe and said bottom case;

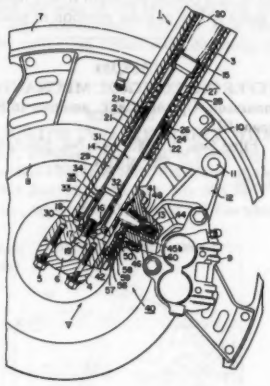
a reservoir chamber communicating with said oil pressure generating chamber;

a main oil passage connected with said oil pressure generating chamber and said reservoir chamber for conducting oil from said oil pressure generating chamber into said reservoir chamber upon a contracting motion between said fork pipe and said bottom case; and

a contraction restraining mechanism cooperating with a brake mechanism of said motorcycle, said contraction restraining mechanism comprising:

a valve mechanism interposed in said main oil passage and operatively connected with said brake mechanism for intercepting said main oil passage upon braking of said motorcycle;

a bypass oil passage connected to said valve mechanism and communicating with said reservoir chamber; and



adjustable orifice means, interposed in said bypass oil passage, for adjusting a resistance to flow of said oil.

4,515,385

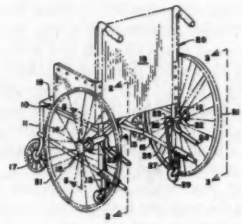
WHEELCHAIR AND ATTACHMENT THEREFOR

Dixon W. Christian, 34 Old Mill Rd., Richmond, Va. 23226

Continuation-in-part of Ser. No. 271,135, Jun. 8, 1981, abandoned. This application Jun. 15, 1983, Ser. No. 504,499

Int. Cl.³ A61G *15/00*

U.S. Cl. 280—289 WC **6 Claims**



1. In a wheelchair comprised of a frame having paired front and rear vertical posts which define an interior region of said frame and paired upper and lower horizontal connecting means extending between front and rear posts, paired front caster wheels mounted on said frame adjacent said front posts, seating means disposed within said interior region generally behind and above said front caster wheels, and a pair of drive wheels rotatably supported by said rear vertical posts on the exterior of said frame on opposite sides of said seating means and adapted to rotate in vertical planes about horizontally disposed axles, said drive wheels being equipped with quick disconnect means, said front caster and drive wheels being adapted to support said wheelchair at four sites for rolling motion upon an underlying substantially planar support surface, the improvement comprising jacking apparatus associated with each rear vertical post, said apparatus being comprised of

a rear caster wheel which engages said frame in a manner to be vertically positionable between uppermost and lowermost positions, a lever having an active portion, and a

handle portion positioned within reach of a seated occupant of said wheelchair,

said active portion being associated with said frame by first pivot means permitting about 90° of movement of said lever in a vertical plane between upright and lower positions, vertical connecting means having an upper extremity attached by second pivot means to said active portion and a lower extremity associated by third pivot means with said caster wheel, and locking means which act to cause said lever to be maintained in said lower position, whereby

when said lever is in its lower position, said rear caster wheel is displaced downwardly by said connecting means to its lowermost position, and when said lever is in its upright position, said rear caster wheel is in its uppermost position, said lowermost position of said rear caster wheel being such as to cause the associated drive wheel to be lifted out of contact with the support surface while placing said rear caster wheel in contact with said support surface, the movement of said lever between said lower and upright positions being achievable by said seated occupant and whereby, when said lever is in its lower position, the seated occupant can unaidedly remove said drive wheels from the frame and return them thereto.

4,515,386

GUARD FOR CHAIN WHEEL

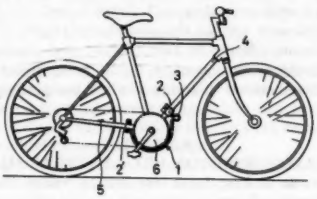
Kanji Tsujimura, 6-16, 4-chome, Ikunonishi, Ikuno-ku, Osaka, Japan

Filed Aug. 10, 1983, Ser. No. 521,919

Claims priority, application Japan, Jun. 27, 1983, 58-100538[U]

Int. Cl.³ B62H *1/02*

U.S. Cl. 280—289 G **2 Claims**



1. A guard for a chain wheel on a bicycle for use in the mountains, comprising an arcuate body extending along substantially the lower half of the outer periphery of the chain wheel so as to cover it, metal fittings for securing said guard at each end thereof to the bicycle frame, and a shock absorbing portion.

4,515,387

HITCH WITH SWIVELING TONGUE

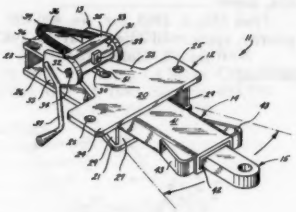
Howard L. Schuck, 705 Meadowview Dr., Celina, Ohio 45822

Filed Mar. 25, 1983, Ser. No. 478,649

Int. Cl.³ B60D *1/00*

U.S. Cl. 280—478 A **14 Claims**

1. A hitch assembly comprising: a mounting member adapted to be attached to a propelled vehicle, a tongue member adapted to be connected to a vehicle to be towed, and pivotal connection means attached to said mounting and tongue members for allowing relative movement between said mounting and tongue members whereby said tongue member can be moved relative to the propelled vehicle to a position for attachment to the vehicle to be towed and including selectively actuatable latching means attached to said mounting member for latching said mounting member and said tongue member in a first position the prevent relative pivotable movement between said members wherein said tongue member includes a wedge and said latching means includes a cam for



engaging said wedge to prevent said relative pivotal movement.

4,515,388

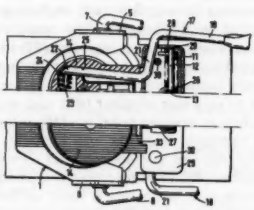
SKI BRAKE

Anton Emert, Oberau; Walter Knabel, Murnau, and Manfred Richert, Munich, all of Fed. Rep. of Germany, assignors to Marker International, Salt Lake City, Utah

Filed Aug. 11, 1982, Ser. No. 407,098

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **5 Claims**



1. A brake for a ski, comprising:

a pair of laterally spaced wire levers, each wire lever being of predetermined diameter and comprising a pivot shaft intermediate a lower arm and an upper arm, said lever being rotatable between a braking position in which said lower arm extends below the ski and outboard from the ski and a non-braking position in which said lower arm does not extend below the ski;

a coil spring disposed between said wire levers for biasing said lower arms outboard from the ski, said coil spring having a diameter no larger than the diameter of either of said levers;

actuating means for urging each lever into said braking position;

a generally circular pedal being rotatable about an axis perpendicular to said pedal and having a thickness about equal to the predetermined diameter of said wire levers, said pedal further having a downwardly facing recess containing the coil spring and receiving the upper arms of each of said wire levers, said pedal receiving pressure from the sole of a ski boot, said pedal being movable by the pressure of the ski boot from a non-skiing position to a skiing position, said levers being rotated into said non-braking position when said pedal means is moved into said skiing position; and

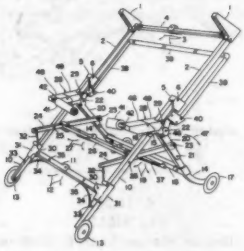
positioning means for holding each of said lower arms in an inboard position against the bias of said coil spring when said levers are in said non-braking position, said positioning means comprising a guide surface on said pedal for engaging and urging inward said upper arms when said pedal is in said skiing position.

4,515,389

BABY CARRIAGE AND ARMREST FOR SUCH BABY CARRIAGE

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed May 2, 1983, Ser. No. 490,489
Claims priority, application Japan, May 21, 1982, 57-86935
Int. Cl.³ B62B *7/06*
U.S. Cl. 280—642 **5 Claims**



1. A baby carriage with armrests, said baby carriage including a main body, said armrests projecting forwardly from said baby carriage main body and positioned on each side of a baby sitting in the baby carriage, comprising an armrest front member (**48**) including horizontal and vertical first wall elements, and an armrest rear member (**49**) including horizontal and vertical second wall elements, first connecting means (**29**) operatively securing said rear member (**49**) to said main body (**10**) of said baby carriage, second connecting means (**50, 53**) for operatively connecting said front member (**48**) in a pivotable manner to said rear member (**49**), said second connecting means including an armrest pivot pin (**50**) extending widthwise of the baby carriage, said first wall elements of said armrest front member (**48**) and said second wall elements of said armrest rear member (**49**) forming respective channel components partially overlapping each other, third connecting means including a pivot control pin (**53**) secured to one of said vertical first wall elements (**51**) of said armrest front member (**48**) in a position spaced a predetermined distance apart from said armrest pivot pin (**50**) and extending substantially parallel to said armrest pivot pin (**50**), wherein said armrest rear member (**49**) comprises a first elongated guide cam track (**54**) extending in one of said vertical second wall elements of said armrest rear member (**49**) along an arc having a center of curvature located at said armrest pivot pin (**50**), said arc having a radius equal to said predetermined distance, said pivot control pin (**53**) being received in said elongated guide cam track (**54**), said third connecting means further including an interlocking lever (**15**) connected to said main body in a position for cooperation with said pivot control pin (**53**), said interlocking lever (**15**) comprising a second cam guide track (**55**) for engagement with said pivot control pin (**53**), whereby said pivot control pin (**53**) cooperates with said first and second cam tracks (**54, 55**), thereby making said armrest (**28**) itself collapsible.

4,515,390

CHASSIS AND SUSPENSION SYSTEM FOR VEHICLES

William H. Greenberg, 23 Sylvia La., Lincoln, R.I. 02865

Filed Apr. 11, 1983, Ser. No. 483,910
Int. Cl.³ B60G *21/00*
U.S. Cl. 280—675 **16 Claims**

1. A chassis and suspension system for a vehicle and the like comprising:

(a) a chassis;

(b) a front subchassis;

(c) a rear subchassis;

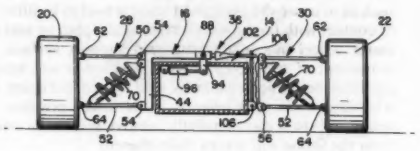
(d) right and left front wheels;

(e) right and left rear wheels;

(f) front wheel connecting means rotatably mounting said front wheels on the right and left sides of said front subchassis, respectively, for supporting said front subchassis on a supporting surface, said front wheels being pivotable to effect steering of said vehicle and being independently resiliently upwardly movable relative to said front subchassis;

(g) rear wheel connecting means rotatably mounting said rear wheels on the right and left sides of said rear subchassis, respectively, for supporting said rear subchassis on a supporting surface, said rear wheels being independently resiliently upwardly movable relative to said rear subchassis;

(h) pivot means pivotally suspending the front and rear portions of said chassis, from said front and rear subchas-



sis, respectively, so that said chassis is pivotable about a substantially longitudinal axis in said vehicle which is above the longitudinal center-of-gravity axis of said chassis;

(i) means interconnecting said chassis to said front subchassis to resiliently restrict the pivotal movement of said front subchassis relative to said chassis, said chassis to front subchassis interconnecting means being independent of and unconnected to said front wheel connecting means; and

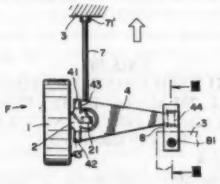
(j) means interconnecting said chassis to said rear subchassis to resiliently restrict the pivotal movement of said rear subchassis relative to said chassis, said chassis to rear subchassis interconnecting means being independent of and unconnected to said rear wheel connecting means.

4,515,391

VEHICLE SUSPENSION WITH LATERAL MEMBER

Masaru Koide, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 21, 1983, Ser. No. 487,155
Claims priority, application Japan, May 31, 1982, 57-80457[U]
Int. Cl.³ B60G *3/00*
U.S. Cl. 280—690 **16 Claims**



9. In a vehicle suspension for a land vehicle with non-steerable road wheels aligned at a toe angle which is normally near the direction of travel of the vehicle, a support for carrying a road wheel on the vehicle body comprising:

(a) a lateral wheel suspending member having a first end supporting a road wheel at at least two points separated in the direction of travel in a fixed spatial relationship and extending toward the body of the vehicle in a direction

predominantly perpendicular to the direction of travel; and

(b) a lever arm pivotably supported by the vehicle body and supporting a second end of said wheel suspending member, said lever arm extending in the direction of travel, an assembly connected to said vehicle body supporting said lever arm for free pivotable movement about a vertical axis to pivot within a horizontal plane in response to transverse forces acting on the road wheel to cause said wheel suspending member both to pivot and move toward the body of the vehicle and cause the road wheel to toe in.

4,515,392

SLOPE MOWER

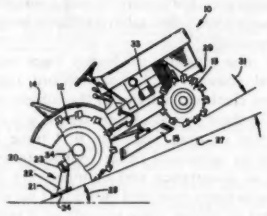
Robert M. Torras, Brunswick, Ga., assignor to Kut-Kwick Corporation, Atlanta, Ga.

Continuation of Ser. No. 385,817, Jun. 7, 1982, Pat. No. 4,453,739. This application Jun. 8, 1984, Ser. No. 618,428

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.³ B60R *27/00*

U.S. Cl. 280—755 **4 Claims**



1. In a tractor vehicle intended for moving or otherwise normally functioning on sloped surfaces while traveling on the sloped surface, the vehicle having a rear axle, front wheels, and having a normal center of gravity forward of the rear axle at a location which establishes the proportion of vehicle weight on the front wheels and thereby normally establishes the maximum angle of forward ascent the vehicle can reach when moving up a sloped surface before tipping back over the rear axle, the method comprising the steps of:

providing weight means on said vehicle in back of said normal center of gravity so as to relocate the center of gravity of the vehicle toward the rear axle at a new center of gravity aft of said normal center of gravity, which allows the front wheels of the vehicle to lift away from the sloped surface when the vehicle exceeds a critical angle of forward ascent substantially less than said maximum angle of forward ascent which the normal vehicle otherwise could reach, thereby causing the front of the vehicle to lift away from the sloped surface in a relatively gradual and controlled manner when the vehicle exceeds said critical angle of forward ascent, so as to signal to the vehicle operator that the critical angle of forward ascent has been reached and to inhibit the normal functioning of the vehicle until the angle of forward ascent is reduced below the critical angle, whereby the vehicle returns to a normal stance and functions with all wheels on the sloped surface; and

limiting the maximum amount of tipping back over the rear axle which the vehicle with said relocated center of gravity is capable of undergoing when said critical angle of forward ascent is exceeded, so that the front wheels of the vehicle can lift no more than a limited amount, assuring that the vehicle cannot tip back over its rear axle and overturn when exceeding the critical angle of forward ascent and while the normal functioning of the vehicle is inhibited,

thereby enabling the driver of the vehicle to regain contact between the front wheels of the vehicle and the sloped surface by reducing the angle of forward ascent of the vehicle on the sloped surface, and allowing the vehicle thereafter to resume its normal function on the sloped surface.

4,515,393

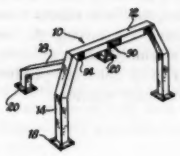
NEON LIGHTED ROLL BAR

Gary E. Sauter, 6957 Wtoming, La Mesa, Calif. 92041

Filed May 12, 1983, Ser. No. 493,776

Int. Cl.³ B60R *27/00*

U.S. Cl. 280—756 **5 Claims**



1. A roll bar for a motor vehicle comprising:

(a) An arched bar having depending ends adapted to mount to a motor vehicle and defining a crossbar positioned substantially over said vehicle when said depending ends are mounted thereto;

(b) A cavity defined in the crossbar portion of said arched bar, and a neon light installed in said cavity and being visible from at least one side of said bar;

(c) said arched bar being generally hollow tubing and said cavity being defined by a cutaway front portion of said crossbar to define a frontally open cavity;

(d) a shatter resistant transparent plate mounted over said cutaway front portion;

(e) said hollow tubing being generally square in cross section and said removed portion comprising a portion of the front side of said tubing;

(f) a pair of rearward braces adapted to mount to rearward portions of said arched bar, said rear braces also being substantially square in cross section; and,

(g) including a plurality of pass-through openings in said braces, said openings being lined with cylinders.

4,515,394

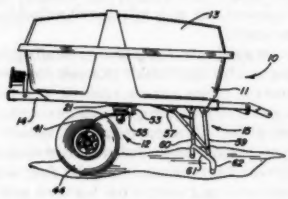
WHEEL LOCK AND STAND ASSEMBLY FOR TRAILER

David J. Zwick, Stoystown, Pa., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Sep. 29, 1982, Ser. No. 428,384

Int. Cl.³ B60S *9/02*

U.S. Cl. 280—764.1 **6 Claims**



1. A wheel lock and stand assembly for a trailer comprising a wheel having a horizontal axis, swivel means for mounting the wheel on the trailer so that the wheel can swivel about a vertical axis and rotate about said horizontal axis, a shaft rotatably mounted on the trailer and a pair of spaced-apart locking

arms directly mounted on the shaft and fixedly secured thereto for rotation therewith, a crank mounted on the shaft for rotating the shaft and the locking arms into a locking position in which the locking arms engage the swivel means and rotate the swivel means and the wheel until said horizontal wheel axis extends generally parallel to said shaft and thereafter prevents rotation of the swivel means, the shaft and the locking arms being movable by the crank to an unlocked position in which the locking arms are not engaged with the swivel means and do not prevent rotation of the swivel means, a stand assembly pivotably mounted on the trailer and movable between a support position in which the stand assembly supports the trailer and a storage position in which the stand assembly is stored underneath the trailer, and link means connecting the stand assembly and the crank for moving the shaft to its locking position as the stand assembly moves to its support position and for moving the shaft to its unlocked position as the stand assembly moves to its storage position.

4,515,395

ADJUSTABLE VEHICLE SEAT BELT ANCHORAGE

Michael Patterson, Carlisle, England, assignor to Kangol Magnet Limited, Carlisle, England

Filed Apr. 28, 1983, Ser. No. 489,325

Claims priority, application United Kingdom, Apr. 28, 1982, 8212301

Int. Cl.³ B60R *21/10*; A62B *35/00*

U.S. Cl. 280—808 **12 Claims**

1. An adjustable shoulder anchorage device for a vehicle seat belt, comprising:

a flexible elongate member;

means mounting said flexible elongate member to extend generally upright between upper and lower securement means in the region of the shoulder of an occupant of a vehicle seat belt with which said vehicle seat belt system is associated;

connector means having spaced generally parallel bar means engaged with said flexible elongate member whereby said connector means can be retained in a selected position along said flexible elongate member; and

support means for supporting said vehicle seat belt said support means being carried by said connector means,

wherein said bar means comprise first, second and third bars with said second bar between said first and third bar, and wherein said elongate member extends from one of the said securement means past said first bar to said second bar, reverses the direction thereof around said second bar, extends between itself and said first bar, reverses the direction thereof around said first bar, and extends to the other of said securement means between said second and said third bar.

4,515,396

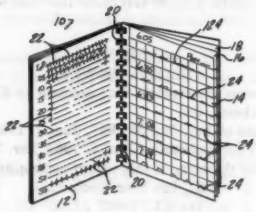
METHOD AND APPARATUS FOR DISPLAYING RECORDS

Daniel A. DuVal, 6765 Griffore Dr., Saginaw, Mich. 48604; Roger N. Kahn, 4680 Ashland, Saginaw, Mich. 48603, and David E. Myers, 2823 Wiles St., Saginaw, Mich. 48602

Filed Apr. 15, 1983, Ser. No. 485,356

Int. Cl.³ B42D *15/00, 11/00*; G01D *9/00*; G01R *13/00*

U.S. Cl. 281—15 R **10 Claims**



1. A graphic record of electrical measurements of a biological subject made over a first relatively large period of time, the display comprising:

a first set of a plurality of display trace records of such electrical activity, each trace record representing the measured electrical activity of the subject over a second, relatively short period of time which is a devisor of said first period of time, with the first trace records being arranged in sequential order representative of their sequence of occurrence and cumulatively displaying the electrical activity over said entire first period of time; and

a second set of display trace records each representative of a selected section of one of the first trace records, the scale of recording of the second trace records being substantially greater than the scale of the first trace records; and

display means for arranging the second trace records in substantial opposition to the first trace records from which they were derived to allow analysis of the micro-activity represented by the second trace records in comparison to the macro-activity represented by the first trace records.

4,515,397

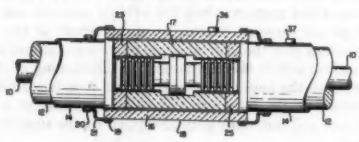
VACUUM INSULATED CONDUIT

Jeffert J. Nowobilski, Orchard Park, and Kenneth C. Kather, Tonawanda, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 1, 1983, Ser. No. 481,237

Int. Cl.³ F16L *59/14*

U.S. Cl. 285—47 **18 Claims**



1. A conduit having reduced thermal leakage at a joint area comprising:

(A) a first pipe having an end thereof;

(B) a second pipe having a diameter greater than that of said first pipe, positioned circumferentially around and axially along said first pipe, terminating at a point short of said first pipe end to define an axial distance from said point to said first pipe end;

(C) bellows, attached at one axial end thereof to said first pipe, having a diameter greater than that of said first pipe

but less than 25 percent of the distance between the first and second pipes, positioned circumferentially around and axially along said first pipe along, at least a part of, said axial distance; and

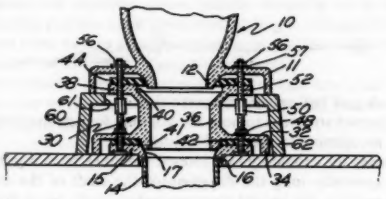
(D) a plate having a solid radial dimension from the furthest radial extent of said bellows to said second pipe, substantially perpendicular to said pipes, connecting said bellows, at the other axial end thereof, with said second pipe and free from contact with said first pipe.

4,515,398

DEVICE FOR ELEVATING CLOSET BOWL

William P. Machon, Sr., 95 Walnut Rd., Barrington, R.I. 02806

Filed Mar. 7, 1983, Ser. No. 472,484
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—59 **7 Claims**



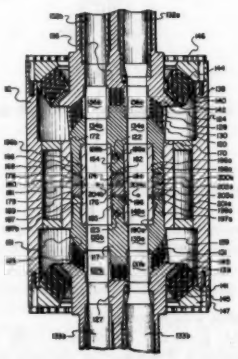
1. A toilet closet bowl device for elevating the bowl above an existing floor flange having upstanding studs, comprising an extender pipe with upper and lower ends having upper and lower flanges extending radially outward and fixed thereto at each end thereof, said lower flange engaging the existing floor flange, a support means embracing the extender pipe and the lower and floor flanges, said support means having an upper surface of a size to allow the bearing rim of a closet bowl to rest thereon, said upper surface of the support means having a height above the floor flange whereby the upper flange of the extender pipe lies above the upper surface thereof.

4,515,399

SYMMETRICALLY LOADED FLEXIBLE CONNECTOR HAVING MULTIPLE PASSAGEWAYS

Paul E. Sullivan, Euless, and George W. Peppel, Arlington, both of Tex., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 27, 1982, Ser. No. 453,634
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—95 **5 Claims**



1. A flexible connector having multiple passageways comprising:

a housing defining a bore oriented about a first longitudinal axis;

an angularly deflectable nipple defining a plurality of first passageways oriented essentially parallel to a second axis, said first passageways extending from an inner end of said nipple assembly to an outer end of said nipple assembly, with the radial and circumferential orientation of said first passageways with respect to said second axis defining a first pattern;

a seat having an inner end adapted to slide within said bore along said first longitudinal axis, said seat defining a plurality of second passageways oriented generally parallel to said first longitudinal axis and extending from an outer end of said seat to said inner end of said seat, with said second passageways oriented radially and circumferentially with respect to said first axis in a second pattern substantially identical to said first pattern, whereby when said first axis and said second axis are maintained in a co-axial relationship with the inner end of said nipple adjacent said outer end of said seat, each of said first passageways may be essentially aligned with a corresponding one of said second passageways;

a plurality of sleeves oriented generally parallel to said first longitudinal axis with each of said sleeves defining a respective continuation passageway from a respective one of said second passageways to a respective one of a third plurality of passageways;

first sealing means for accommodating longitudinal movement of said seat with respect to said housing while maintaining a fluid-tight relationship between the respective one of said continuation passageways within said sleeve and the respective ones of said second and third passageways;

a piston plate having a cross-sectional shape and dimension such that when placed within said bore of said housing, adjacent said inner end of said seat and said sleeves, whereby there is defined between said piston plate, said seat said sleeves and the inner diameter of said bore a first pressure chamber which will expand in volume as said piston plate is slid along said first longitudinal axis away from said seat;

second sealing means for maintaining a pressure and fluid-tight seal between said piston plate and said central bore as said piston plate is slid longitudinally with respect thereto;

third sealing means between said first piston plate and said sleeves for maintaining a pressure and fluid-tight seal therebetween as said piston plate moves longitudinally with respect to said seat; and

first aperture means between the interior of a first one of said sleeves and said first pressure chamber for equalizing the pressure therebetween; and means to hold the joint elements in an assembled and functional relationship.

4,515,400

WELLHEAD ASSEMBLY

Jerry D. Smith, Houston, and Edward J. Szymczak, Spring, both of Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Mar. 15, 1982, Ser. No. 358,445
Int. Cl.³ F16L *7/00*
U.S. Cl. 285—141 **8 Claims**

1. A wellhead assembly comprising

a wellhead member having a central bore therethrough and an internal shoulder tapered upwardly and outwardly,

a wellhead hanger within the central bore of said wellhead member and having a downwardly facing external shoulder and means for supporting a tubular string from the lower end of said hanger,

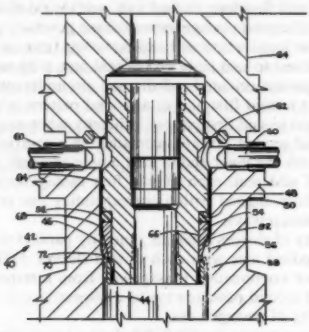
an energizing ring surrounding said hanger below said shoulder and having an external downwardly and inwardly extending tapered surface,

a support ring seated on said wellhead member shoulder and having an external vertical surface with phonographic

grooves therein and an internal downwardly and inwardly extending tapered surface substantially mating with said external tapered surface on said energizing ring,

the tapered surfaces on said energizing ring and said support ring having an angle substantially less than 45° with respect to vertical,

the lower end of said energizing ring extending below said support ring when they are in supporting engagement between said hanger and said wellhead member, and



means on the lower exterior surface of said hanger for engaging and supporting said rings thereon during running and pulling of said hanger,

the tapered surfaces of said rings coacting when supporting said hanger to transfer at least a portion of the hanger load through said support ring vertical grooved surface to the surface of the bore of said wellhead member above its internal shoulder.

4,515,401

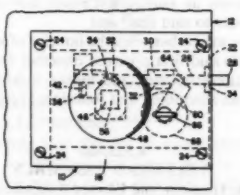
DOOR LOCK

William F. Klay, 541 Seale Ave., Palo Alto, Calif. 94301

Division of Ser. No. 103,882, Dec. 17, 1979,. This application May 14, 1981, Ser. No. 263,433

Int. Cl.³ E05C *1/12*

U.S. Cl. 292—170 **5 Claims**



1. A lock for a door having a recess formed in the end thereof intermediate its top and bottom margins comprising: a U-shaped member having a pair of spaced sides and an end wall interconnecting the sides; means engageable with the sides for mounting the member on the door with the sides and end wall enclosing said recess, said end wall having an opening therethrough; a lock bolt; means on the inner surfaces of the sides for mounting the lock bolt in the space therebetween for movement from an extended, locked position with the end of the lock bolt extending through and projecting laterally from the outer face of said end wall to a retracted, unlocked position with said one end of the lock bolt inwardly of the outer face of the end wall; a flat plate accessible from either side of said member and extending into the space between the sides for moving the lock bolt from said extended position to said retracted position, each side having a slot therethrough for shiftably receiving the plate, the slots of said sides being horizontally aligned with each other, said lock bolt having a slot therethrough defining an inclined edge extending transversely of the path of travel of said lock bolt, said plate being adjacent to the lock bolt and having a pin thereon within the space between the sides, the pin extending into the slot in the lock bolt and normally engaging said inclined edge means biasing said lock bolt toward said extended position; and means shiftably mounted on at least one of the sides within said space for releasably holding said lock bolt in said extended position.

4,515,402

GOLF BALL RETRIEVER

Jack D. Sedan, 245 Portola Rd., Carmel Woods, Calif.

Filed Aug. 1, 1983, Ser. No. 519,281

Int. Cl.³ A63B *47/02*

U.S. Cl. 294—19.2 **19 Claims**

1. A golf ball retriever, comprising:

a looped structure to hold the golf ball for retrieval defining an opening to receive the ball; and

means for extending said looped structure from a golf club generally long the direction of the shaft of the club to position the looped structure substantially away from an end of the club and substantially extend the reach of the club for retrieval;

said extending means defining an opening to receive the golf club to support the retriever for said extending;

said extending means opening being oriented to pass through said extending means substantially perpendicularly to said extending direction, in substantially the same orientation as said opening to receive the ball.

4,515,403

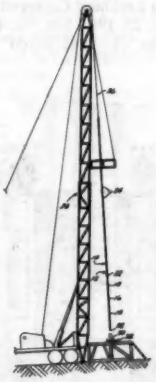
OVERSHOT

Alton E. Cheek, 1949 Vuelta Grande Ave., Long Beach, Calif. 90815

Filed Jul. 16, 1982, Ser. No. 399,139

Int. Cl.³ E21B *31/02*

U.S. Cl. 294—86.31 **12 Claims**



1. An overshot which comprises:

an elongated, generally cylindrical body having a lower portion defining downwardly opening receptacle cavity means;

at least one elongated locking arm generally longitudinally disposed in said body, said arm having a lower gripping

finger portion located in said lower body portion with upwardly facing locking shoulder means therein exposed to the inside of said receptacle cavity means, and said arm having an upper portion exposed externally of the body for manipulation of the arm,

said arm being both longitudinally slidable and radially tiltable in said body between a lower locking position in which said shoulder means is radially inwardly positioned within said receptacle cavity means and an upper release position in which said shoulder means is substantially radially outwardly displaced from said receptacle cavity means,

generally longitudinally directed biasing means within said body and operable between said body and said arm to bias said arm toward its said lower locking position, and,

cam means on said body and cooperating cam follower means on said arm for radially tilting said arm so as to move said shoulder means radially inwardly to its said locking position upon downward sliding movement of the arm from its said upper position to its said lower position under the influence of said biasing means,

said externally exposed upper portion of said arm enabling the arm to be manipulated from its said locking position to its said release position.

4,515,404

SEAT SLIDING DEVICE

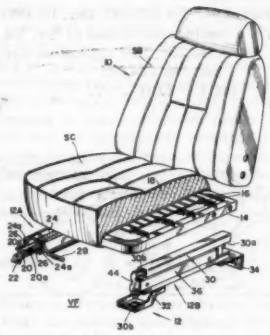
Shinichi Nishimura, Zama; Saburo Mizuno, and Kiyoshi Miyamoto, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited and Ohio Seisakusho Co., Ltd., both of Yokohama, Japan

Filed Dec. 6, 1982, Ser. No. 447,132

Claims priority, application Japan, Jan. 21, 1982, 57-6739

Int. Cl.³ B60N *1/02*

U.S. Cl. 296—65 R **7 Claims**



1. A seat sliding device for moving a seat relative to a floor, comprising:

a stationary rail secured to said floor;

a movable rail secured to said seat and slidable on and along the stationary rail to achieve the movement of said seat; and

a slide block of plastics moulded on a selected one of said stationary and movable rails in such a manner that the slide block is disposed between the two rails thereby improving the sliding characteristics of the movable rail relative to the stationary rail,

wherein said slide block is divided into two sections in the longitudinal direction of the selected rail, leaving a predetermined clearance between these two sections, and wherein the two sections of said slide block cover the longitudinal both ends of the selected rail respectively.

4,515,405

FAIRING DEVICE FOR MOTORCYCLES

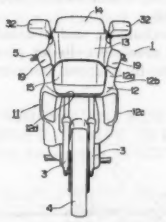
Tetsuo Ogishima, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 379,324, May 18, 1982, abandoned. This application Jul. 12, 1984, Ser. No. 629,752

Claims priority, application Japan, May 18, 1981, 56-71709[U]; May 18, 1981, 56-71710[U]; May 18, 1981, 56-71711[U]

Int. Cl.³ B62J *17/02*

U.S. Cl. 296—78.1 **14 Claims**



1. In a fairing device for a motorcycle, including a fairing assembly, a pair of rear mirrors mounted on respective sides of said fairing assembly and a pair of blinker units mounted on respective sides of said fairing assembly, wherein said fairing assembly is mounted on a frame of said motorcycle so as to cover a front portion of said motorcycle and has at a front end portion thereof a recess in which a headlight is disposed, the improvement wherein:

said fairing assembly comprises a fairing body defining a lower part thereof, an upper member combined with and disposed above said fairing body and a windscreen fixed with said upper member, said fairing body and said upper member defining said front end recess therebetween and having mating ends which extend on each side of said fairing assembly toward said front end recess;

each of said blinker units comprises a lens member, a base member for holding said lens member, and a blinker bulb disposed in a space defined by said lens member and said base member;

each of said blinker units has a streamlined external shape substantially contiguous with the external shape of said fairing assembly;

each of said blinker units is secured to said fairing assembly in close proximity to said mating ends of said fairing body and said upper member, behind said headlight and below said rear mirror and said lens members of said pair of blinker units are positioned at the rightmost portion and at the leftmost portion, respectively, of said fairing assembly in front of a grip portion at the corresponding side of a handlebar of said motorcycle whereby said blinker units guide wind outwardly and prevent it from directly blowing against said grip portions.

4,515,406

HEADREST FOR MEDICAL TREATMENT CHAIR

Kunio Fujiyama; Kei Okamoto, both of Osaka, and Noriyuki Yoshikawa, Ueno, all of Japan, assignors to Takara Company, New York, Inc., Somerset, N.J.

Filed Sep. 28, 1982, Ser. No. 425,310

Int. Cl.³ A61G *15/00*; A47C *7/38*

U.S. Cl. 297—409 **10 Claims**

1. A chair for human dental or medical treatment and having an improved adjustable headrest support, which comprises:

a. a chair, said chair having a frame,

b. a seat, mounted on said frame;

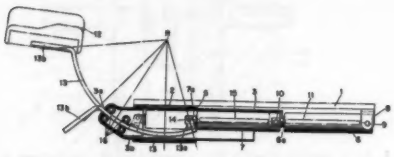
c. a headrest;

d. a bearing race rotatably mounted to a first transverse supporting shaft,

e. a flat curved strip member, one end of said strip member being attached to said headrest, said strip member defining part of a circle, and means mounting said strip member for circular movement around the center of the circle, the other end of said strip member being attached to said bearing race, whereby movement of said strip member corresponds to the natural movement of a human neck,

f. said mounting means comprising at least one pair of opposed cylindrical guide rollers on said frame, said rollers straddling said strip member and extending contiguously across the surface of said strip member substantially transverse to the linear longitudinal axis of said strip member, so as to guide the motion of said strip member along said longitudinal axis,

g. a hydraulic mechanism, said hydraulic mechanism comprising a fluid pressure cylinder pivotally linked at one end to said frame by a second transverse supporting shaft,



said cylinder containing a piston plunger having a piston head, the outer end of said piston plunger being pivotally attached to the other end of said strip member by said first transverse supporting shaft and said bearing race, wherein said piston plunger moves in a horizontal path causing said curved strip member to move in a circular path in conjunction with said bearing race, resulting in the different positioning of said headrest without placing of a human body in a strained position,

h. means to pass a hydraulic fluid into said cylinder, so that said piston head and piston plunger may be displaced in said cylinder, and said headrest may be positioned in said way;

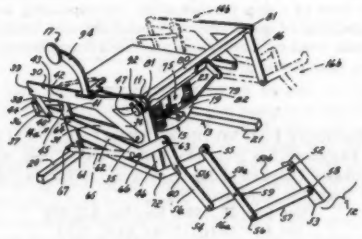
i. a spring, said spring extending between said first shaft and said second shaft, to produce substantially smooth backdown of said piston plunger and piston head when fluid pressure in said cylinder is reduced.

4,515,407

LATCH FOR A CHAIR'S FOOTREST ASSEMBLY

Michael A. Crum, LaGrange, Ky., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jul. 22, 1982, Ser. No. 400,982
Int. Cl.³ A47C 7/50, 1/02
U.S. Cl. 297—429 **22 Claims**



1. A footrest assembly for a chair, said footrest assembly comprising

a footrest mechanism for opening and closing a foot rest between full extend and full retract positions, said footrest mechanism being connectable to said chair,

a friction latch connected with said footrest mechanism, said friction latch being manually movable by a chair's occupant between latch and release positions when the occupant is seated in said chair, said friction latch functioning to permit said footrest to be restrained in any position desired by the chair's occupant between said full extend and full retract positions and, said friction latch functioning to prevent closing movement of said footrest from any extend position back toward said full retract position in response to a minor force exerted against said footrest as created by the legs of the chair's occupant when those legs are resting on said footrest comfortably while the occupant is sitting in the chair, but said friction latch also functioning to permit closing movement of said footrest from any extend position back toward said full retract position in response to a major closing force exerted against said footrest as created by the legs of the chair's occupant when those legs are drawn thereagainst while the occupant is sitting in the chair, that major closing force imparted by the legs of the chair's occupant to said footrest being substantially greater than the minor closing force imparted to said footrest when the legs of the chair's occupant are simply resting thereon with no leg effort being made to close the footrest, and

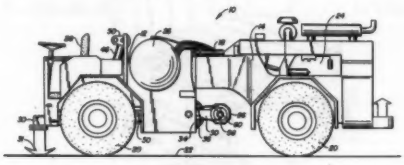
a footrest extension motor connected with said footrest mechanism, said motor functioning to open said footrest toward said full extend position from said full retract position, as well as from any partial extend position, when said friction latch is in said release position, said motor providing an opening force less than that of said major closing force.

4,515,408

COUNTERWEIGHT SUPPORT FOR RESONANTLY DRIVEN TOOL

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Company, Sparks, Nev.

Continuation-in-part of Ser. No. 329,149, Dec. 10, 1981, Pat. No. 4,402,629, which is a continuation-in-part of Ser. No. 157,138, Jun. 5, 1980, Pat. No. 4,340,255. This application Apr. 13, 1983, Ser. No. 484,395
Int. Cl.³ E01C 23/12
U.S. Cl. 299—37 **17 Claims**

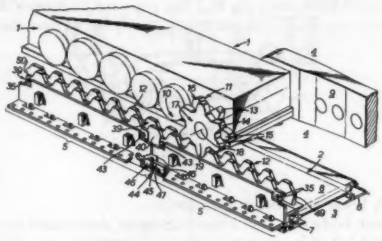


1. In a resonantly driven power tool including a frame, a resonant beam having a pair of nodes spaced inwardly from the ends of the beam and input and output antinodes at respective input and output ends of the beam, means for pivotably attaching the resonant beam to the frame at the node proximate the input end of the beam, a weight superimposed over the node proximate the output end of the beam, an oscillator at the input end of the beam for vibrating the beam at at least near its resonant frequency, and a working tool at the output end of the beam, improved means for positioning the weight relative to the resonant beam comprising means for linking the weight to the resonant beam at the node proximate its output end, a member fastened to the weight and extending to a position adjacent the node of the beam proximate its input end, and means for pivotably mounting the member to the frame at said node proximate the input end of the beam so that the member and attached weight are rotatable about the same axis as the resonant beam.

4,515,409
MINING MACHINE

George A. Parrott, Wakefield, England, assignor to Dresser Europe S.A., Brussels, Belgium

Filed Jul. 17, 1981, Ser. No. 284,516
Claims priority, application United Kingdom, Jul. 18, 1980, 802356
Int. Cl.³ E21C 29/22
U.S. Cl. 299—43 11 Claims



1. A haulage system for a mining machine, comprising at least one mining machine mounted on and/or guided by an armoured, scraper chain conveyor and reciprocable with respect to said conveyor, said conveyor extending along a mineral face and comprising a plurality of individual pans secured together end-to-end, a face side sidewall and a goaf side sidewall incorporated in each of said pans, a deck plate interconnecting said sidewalls of each said pan, one of said sidewalls being provided with a rack having two rows of laterally spaced rack teeth of identical pitch, said rack teeth of one said row being staggered with respect to said rack teeth of the other of said rows, an articulated joint securing together adjacent rack ends of adjacent pans, while teeth of one of said rows terminate short of said teeth of the other row to create a space between adjacent ends of adjacent shortened rack rows of adjacent pans, and a bridging tooth located in said created space and forming part of said articulated joint, said bridging tooth being provided with elongated mounting holes through which said bridging tooth is connected to said toothed plates to provide for tooth space compensation, and said machine further comprising at least one power driven haulage sprocket having two sets of peripherally arranged teeth of identical pitch, said sets being laterally spaced from one another and one of said sets being angularly staggered with respect to the other of said sets such that one of said sets is engageable with each of said rows of teeth of said rack.

4,515,410
RACK ASSEMBLY

Thomas Trumper, Werne; Gunther-Dietmar Schoop, Ottmarsbocholt; Fritz Borgschulte, and Friedrich Krummnack, both of Lünen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

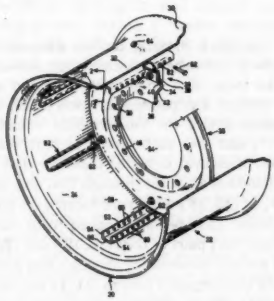
Filed Aug. 12, 1983, Ser. No. 522,801
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230382
Int. Cl.³ E21C 35/20
U.S. Cl. 299—43 22 Claims

1. A rack assembly for a mine winning machine drive arrangement, the rack assembly being associated with a longwall conveyor along which a mine winning machine is movable by said drive arrangement, the rack assembly comprising a plurality of rack sections and a plurality of support members for connecting the rack sections to the longwall conveyor, wherein each of the rack sections has a respective downwardly-extending coupling pin at each end thereof, each of the coupling pins extending through an aperture in a respective support member with a predetermined amount of play, and each of the coupling pins having a retaining member for preventing that coupling pin from moving out of the associated aperture, the rack sections of each adjacent pair of rack sections being relatively pivotable in vertical and horizontal directions and being relatively movable to a predetermined extent in the longitudinal direction of the rack assembly.

4,515,411
WHEEL HAVING ADJUSTMENT FOR AXIAL POSITION OF RIM RELATIVE TO DISC

Maurice Taylor, 1409 Kensington, Grosse Pointe Park, Mich. 48230

Filed Aug. 16, 1982, Ser. No. 408,403
Int. Cl.³ B60B 23/12
U.S. Cl. 301—9 TV 8 Claims

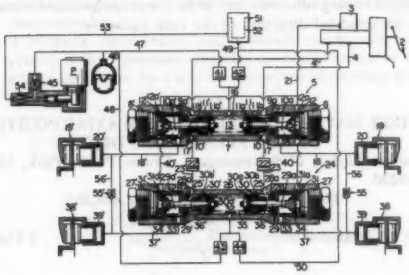


1. A wheel for a vehicle, said wheel comprising a wheel disc lying transverse to the rotational axis of said wheel and having a radially outer peripheral portion, a wheel rim extending around the peripheral portion of said wheel disc and having a pair of circumferentially extending bead seats spaced apart along said rotational axis and interconnected by a rim base having an inwardly directed peripheral portion, and connecting means to connect said rim to said wheel disc at a selected one of a plurality of locations spaced along said rotational axis, said connecting means including a plurality of channel members connected to one of said peripheral portions at circumferentially spaced locations, each channel member comprising a pair of circumferentially spaced abutment surfaces extending radially from said one peripheral portion with each of said pairs of surfaces defining a channel extending parallel to said rotational axis, a plurality of connecting members each snugly received in a respective one of said channels between said abutment surfaces and displacable relative to said abutment surfaces along said channel, said members extending toward the other of said peripheral portions and being attached thereto by fastening means and releasable stop means acting between said channels and said connecting members to secure said connecting members at a selected position in said channels with said connecting members in abutment with said abutment surfaces to transmit torque applied to rotate said wheel about said rotational axis, release of said stop means permitting relative movement between said disc and said rim along said axis of rotation to vary the track of the vehicle upon which the wheel is mounted.

4,515,412
DUAL TYPE ANTILOCK BRAKING DEVICE FOR FOUR-WHEELED VEHICLES

Makoto Sato, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 515,818
Claims priority, application Japan, Jul. 22, 1982, 57-111123[U]
Int. Cl.³ B60T 8/02
U.S. Cl. 303—6 R 1 Claim

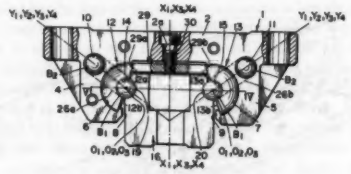


1. In an antilock braking device wherein braking wheel cylinders for a four-wheeled vehicle are connected with each other in the form of X to provide first and second braking hydraulic systems independent of each other, a dual type antilock braking device for four-wheeled vehicles comprising; cylinders (7) and (26) each closed at both ends thereof and divided into a central cylinder chamber and a pair of end cylinder chambers adjacent through first and second partition walls (9, 9') or (28, 28') which are located on both sides of said central cylinder chamber and spaced from each other in the axial direction; and pairs of rods (10, 10') and (29, 29') each pair capable of slidably penetrating through said partition walls (9, 9') or (28, 28'), having first pistons (11, 11') or (30, 30') disposed in said central cylinder chamber and having second pistons (12, 12') or (31, 31') disposed in said corresponding end chambers, wherein primary braking hydraulic chambers (6) and (25) formed between said first partition wall (9), (28) and said corresponding first pistons (11), (30) are communicated with a hydraulic source in said first braking hydraulic system, secondary braking hydraulic chambers (14) and (33) formed between said first partition walls (9), (28) and said corresponding second pistons (12), (31) are respectively communicated with wheel cylinders (19) and (38) for front and rear wheels in said first braking hydraulic system, primary braking hydraulic chambers (6') and (25') formed between said second partition walls (9'), (28') and said corresponding first pistons (11'), (30') are communicated with a hydraulic source in said second braking hydraulic system, secondary braking hydraulic chambers (14') and (33') formed between said second partition walls (9'), (28') and said corresponding second pistons (12'), (31') are respectively communicated with wheel cylinders (19') and (38') for front and rear wheels in said second braking hydraulic system, antilock controlling hydraulic chambers (13) and (32) respectively formed between said paired first pistons (11) and (11') and between said paired second pistons (30) and (30') are communicated with an antilock controlling hydraulic system adapted to regulate output oil pressure from said secondary braking hydraulic chambers (14, 14', 33, 33'), and said rods (10, 10', 29, 29') are respectively formed with communicating grooves (10*a*, 10*a*', 29*a*, 29*a*') through which said adjacent primary and secondary braking hydraulic chambers (17, 14; 17',14'; 36, 33; 36', 33') are communicated with each other when said rods are moved toward said antilock controlling hydraulic chambers (13) or (32) by a distance exceeding a given amount.

4,515,413
LINEAR SLIDE BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,617
Int. Cl.³ F16C 29/06
U.S. Cl. 308—6 C 4 Claims



1. A linear slide bearing comprising:

a main body being an integral member constituted by right and left skirt portions defining a central cavity therebetween, each skirt portion being provided in its inner surface with a race-receiving groove opened to said central cavity, said race-receiving groove having a stopper projecting at its lower arcuate end, and each skirt portion further having a non-loaded ball passage bored therethrough;

a pair of right and left bearing races each constituted by an arcuate member of semicircular cross-section having a barrel-like outer peripheral surface and rockably mounted within the corresponding race-receiving groove formed in said main body, said arcuate member being provided in its inner surface center with a loaded ball groove having a curvature center which is coincident with that of said race-receiving groove;

a race-pressing member constituted by a wedge member adjustably screwed to the inner surface of a ceiling portion of said main body, said race-pressing member being adapted to press said bearing races toward said stoppers with its wedge surfaces which are simultaneously made to abut on one of the inner side surfaces of said bearing races;

a track shaft adapted to be fitted in said central cavity of said main body and provided on its right and left side surfaces with loaded ball grooves each having a curvature center which is coincident with that of the corresponding loaded ball groove on each bearing race;

a pair of front and rear end covers constituted by cover members adapted to be secured to the longitudinal end surfaces of said main body, each cover member being provided in its inner surfaces with ball turning grooves providing communication between loaded ball passages, which are defined by said loaded ball grooves on said bearing races and track shaft, and said non-loaded ball passages formed through said main body, as well as race retaining grooves for supporting one of the ends of said bearing races; and

balls adapted to be recirculated through said loaded ball passages and non-loaded ball passages respectively communicated with each other.

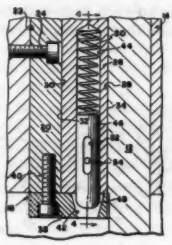
4,515,414
AUTOMATIC ADJUSTING GIB ASSEMBLY

Carl H. Werth, Jr., Bridgeport, Mich., assignor to Werth Engineering, Inc., Bridgeport, Mich.

Filed Oct. 21, 1983, Ser. No. 544,208
Int. Cl.³ F16C 29/12
U.S. Cl. 308—3 R 6 Claims

1. In a device for a machine tool slide assembly or the like comprising a first member having an elongate guide rail with flat parallel longitudinal exterior side walls, a second member having an elongate guide rail receiving slot therein having flat

parallel longitudinal interior side walls, the transverse width of said slot being greater than the transverse width of said rail to define a space between one pair of adjacent side walls of said rail and said slot when the other pair of adjacent side walls are in face-to-face engagement with each other, and an elongate gib disposed within said space and engaged between said one pair of adjacent side walls of said slot and rail, said gib comprising a first elongate gib element fixedly mounted on the side wall of one of said members and a second elongate gib element slideably engaged between said first gib element and the adjacent side wall of the other of said members, said gib elements



engaging each other in face-to-face engagement along complementary flat longitudinal side surfaces inclined relative to said side walls whereby relative sliding movement of said gib elements transversely of said inclined side surfaces in one direction exerts a wedging action urging said one pair of adjacent side walls away from each other; the improvement comprising a cap fixedly secured to each end of said first gib element and projecting transversely from said first gib element across the corresponding end of said second gib element, and spring loaded cam means engaged between said second gib element and at least one of said caps resiliently biasing said second gib element in said first direction relative to said first gib element.

4,515,415

PLAIN BEARING

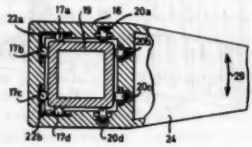
Franz Szenger, Konigsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stuftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 537,022

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1982, 3237085

Int. Cl.³ F16C *29/02, 29/06*

U.S. Cl. 308—6 R **6 Claims**



1. Plain bearing for a part guided longitudinally on a guide rail (9, 19), rollers (25 to 28; 17, 18) being used at least in part in the bearing as plain-bearing elements whose longitudinal axes are aligned parallel to the direction of guidance, characterized by the fact that the rollers are resiliently retained on the guided part (4; 16) perpendicular to the direction of guidance.

4,515,416

LINEAR SLIDE BEARING

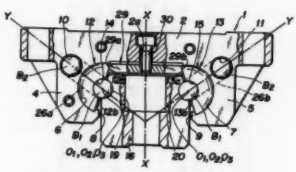
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagava-Ku, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,139

Claims priority, application Japan, May 13, 1983, 58-83828

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **5 Claims**



1. A linear slide bearing comprising:

a main body of channel-like cross-section having a ceiling portion and a pair of skirt portions defining a central cavity therebetween, each skirt portion being provided in its inner surface with a race-receiving groove of semi-circular cross-section opening to said central cavity, said race-receiving groove having a stopper projected at its lower arcuate end, each skirt portion further having a non-loaded ball passage longitudinally formed therethrough;

a pair of right and left bearing races each in the form of an arcuate member of semi-circular cross-section mounted in each of said race-receiving grooves in said main body, said arcuate member being provided in the center of its inner surface with a loaded ball groove having a center of curvature coincident with that of said race-receiving groove;

a race-pressing member in the form of a wedge member adjustably screwed to the inner surface of said main body ceiling portion, said race-pressing member having wedge surfaces adapted to be simultaneously placed into abutting engagement with one side surface of each of said bearing races for pressing said bearing races toward said stoppers;

a track shaft adapted to be fitted in said central cavity in said main body and provided on its right and left side surfaces with loaded ball grooves each having a center of curvature coincident with that of the corresponding one of said bearing races;

a pair of front and rear end covers secured to front and rear end surfaces of said main body, each cover having race retainer grooves for supporting one end of said bearing races, and being provided in its inner surfaces with ball turning grooves for connection between loaded ball passages, which are defined by said loaded ball grooves in said bearing races and in said track shaft, and said non-loaded ball passages, formed in said main body; and

balls adapted to recirculate through said loaded ball passages and non-loaded ball passages connected with each other.

4,515,417

GROUNDING DEVICE FOR PREVENTING ELECTROLYTIC CORROSION IN THE BEARINGS OF ROTARY ELECTRIC MACHINES

Akiyoshi Shiraishi, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,592

Claims priority, application Japan, Nov. 24, 1982, 57-178622[U]

Int. Cl.³ F16C *41/04*

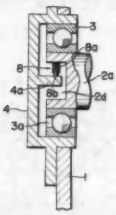
U.S. Cl. 384—445 **3 Claims**

1. A rotary machine having a grounding device for preventing electrolytic corrosion in the bearings thereof, comprising:

a stator having means for being grounded;

a rotor having a shaft, in said stator;

a bearing rotatively supporting said shaft;
an electrically conductive end cover mounted on said stator so as to surround said bearing; and
a centrifugal contact point mounted on said shaft, said contact point being responsive to rotation of said shaft so



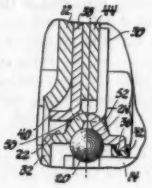
as to be in contact with said end cover when said shaft is standing still or rotating at low speeds to short-circuit said shaft and said end cover, and separated from said end cover to break the short-circuited condition as the speed of rotation of said shaft increases.

4,515,418

BEARING ASSEMBLY WITH STAMPED RACES

Martin J. Hogan, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1983, Ser. No. 519,184
Int. Cl.³ F16C *33/60, 33/72, 43/00*
U.S. Cl. 384—502 **4 Claims**



1. A bearing assembly incorporating stamped races of the type having at least one angular contact raceway formed of two raceway halves, each raceway half being integral with a race and terminating on a ball circle of a ball complement, comprising,

a series of flanges disposed circumferentially about a terminus of each raceway half on either side of the ball circle, the flanges of each race interfitting and alternating with the flanges of the other race and overlying the raceway half of the other race when the two races are placed together with the ball complement therebetween,

and biasing members, receivable between the interfitted flanges of the races and being of a thickness sufficient to bias the flanges of each raceway half apart, said biasing serving to maintain the races together as an assembly.

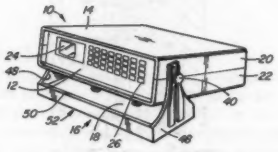
4,515,419

ELECTRONIC INSTRUMENT WITH STAND DOUBLING AS CONSOLE COVER

Herbert J. Hampel, Feasterville, Pa., and Arthur G. Willers, Delran, N.J., assignors to Northern Telecom Limited, Ontario, Canada

Filed Jun. 22, 1982, Ser. No. 390,970
Int. Cl.³ A47B *81/06;* **B65D** *25/24*
U.S. Cl. 312—7.1 **2 Claims**

1. An electronic instrument having a cabinet, a front console with a plurality of input/output elements visible thereat, a flat cover/stand having a handle attached at one side and first and second arms integral with the cover/stand and extending from the other side thereof, a shaft axis extending through said cabinet and an elongated slot formed in a respective arm, said shaft axis passing through each said slot to permit pivotal and translational movement between said cabinet and said cover/stand about said shaft axis, wherein a part of the arm defining each said slot has a first region laterally adjacent a central part of the slot and second regions laterally adjacent flanking parts of the slot, the arm having a surface relief such that the first region is higher than the second regions thereby to form abutment surfaces, a shaft at each side of the cabinet aligned on said shaft axis and a knob mounted on each shaft, each knob having a shank portion, and means for movably biasing each knob along said shaft axis to produce a positive abutment between the shank portion of said each knob and the abutment surface of a respective slot such that said respective slot can be moved



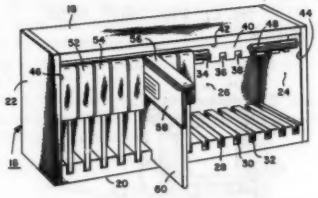
along said respective shank portion to position opposite sides of said respective central part to lock the cabinet, respectively, in a carriage position or an operating position such that, in the carriage position, the cover/stand is held against the console with a positive abutment existing between the knob shank portions and respective abutment surfaces on one side of said central parts to prevent movement of the cover/stand away from the cabinet when the instrument is lifted by the handle, and, in the operating position, the cover/stand is held away from the console and positioned to rest against an instrument supporting surface and to support the cabinet in an inclined position with a positive abutment existing between the knob shank portions and respective abutment surfaces on the opposite sides of said central parts to prevent movement of the cabinet towards the cover/stand.

4,515,420

STORAGE CONTAINER WITH MOVABLE IDENTIFICATION TABS

Peter T. Grosch, 2070 Wharton Rd., Glenside, Pa. 19038

Filed Jun. 24, 1983, Ser. No. 507,746
Int. Cl.³ A47B *81/06*
U.S. Cl. 312—12 **13 Claims**



1. A storage container for multiple articles which have two straight, narrow, opposed parallel edges, such as magnetic storage diskettes, audio cassettes, phonorecords and the like, comprising:

a box;

means within the box for holding a plurality of said articles in side-by-side fashion in said box, with each article in one of a plurality of predetermined article storage positions,

said holding means permitting movement of said articles into and out of the box in directions parallel to said opposed parallel edges;

said box having an access opening permitting articles which are capable of being held by said holding means to be inserted into and withdrawn from the box;

a series of tabs, each tab being associated with one of said predetermined article storage positions, and each tab having means for carrying indicia for identifying the article belonging in its associated article storage position;

means on said box for supporting said tabs so that each tab is movable, independently of the other tabs in the series, from a closed position in which the tab prevents articles from being moved into and out of its associated article storage position, to an open position in which the tab permits articles to be moved into and out of its associated article storage position;

a bar fixed to the box and extending across said access opening in a direction perpendicular to the plane defined by said two opposed parallel edges of each article when stored in the box, each of the tabs in the series having means grasping said bar and being swingable thereon from its closed position to its open position; and

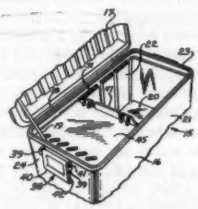
cooperable means, on the grasping means of said tabs and on said bar, for retaining said tabs in one of their closed and open positions until said tabs are forcibly moved therefrom manually.

4,515,421

MULTIPLE USE SHELF FOR COOLER

William J. Steffes, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Nov. 7, 1983, Ser. No. 548,978
Int. Cl.³ A47B *96/02*
U.S. Cl. 312—351 **7 Claims**



7. In combination:

a cooler having a horizontally extending bottom wall, parallel front and back walls extending upwardly from the bottom wall, and parallel end walls extending oetween the front and back walls, each of the front and back walls having an inside surface which is provided with vertically extending retaining means for holding a shelf in a vertical position and horizontally extending supporting means for holding a shelf in a horizontal position, and

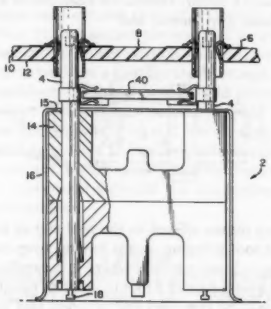
a generally flat shelf having a pair of side edges, the side edges being engageable with the retaining means on the front and back walls of the cooler when the shelf is retained in a generally vertical position, the side edges being engageable with the supporting means on the front and back walls of the cooler when the shelf is supported in a generally horizontal position, the shelf including at least one tongue which extends generally perpendicularly to the generally flat surface of the shelf so as to engage one of the vertically extending retaining means whereby the shelf is restrained from horizontal movement when in the horizontal position.

4,515,422

PIN RECEPTACLE INTENDED FOR MOUNTING IN A CIRCUIT BOARD

James Pritulsky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1983, Ser. No. 543,210
Int. Cl.³ H01R *23/72*
U.S. Cl. 339—17 C **7 Claims**



7. An electrical assembly of a contact pin received in a pin receptacle mounted in a circuit board hole in a circuit board having first and second surfaces and having at least one conductor on the first surface which extends to the circuit board hole, the pin receptacle being a hollow tubular stamped and formed member having a first end and a second end, the pin receptacle being mounted in the circuit board hole with the first end proximate the first surface and with the second end proximate the second surface and the contact pin being received in the receptacle through an end, the pin receptacle having a pin contacting portion and a conductor contacting portion for contacting an inserted pin and for contacting the circuit board conductor, the pin receptacle being characterized in that:

the tubular member has a contacting arm extending therefrom, the contacting arm having a fixed end which is integral with the tubular member proximate to the second end of the tubular member, an intermediate portion, and a free end portion, the intermediate portion extending into the interior of the tubular member, the pin contacting portion being on the intermediate portion, the free end portion extending laterally from the intermediate portion, laterally outwardly of the tubular member and away from the axis of the tubular member, the conductor contacting portion being on the free end portion whereby

engagement of the contact pin with the pin contacting portion urges the conductor contacting portion of the contacting arm against the circuit board conductor to effect electrical termination therewith.

4,515,423

EXTENSION DEVICE FOR ELECTRICALLY POWERED TOOLS

Jerry R. Moore, 12111 Cullman, Whittier, Calif. 90604, and C. Peter Van Dusseldorp, 560 E. Second St., La Habra, Calif. 90631

Filed Apr. 4, 1983, Ser. No. 481,898
Int. Cl.³ H01R *11/00*
U.S. Cl. 339—28 **13 Claims**

1. An extension device for use with electrically powered hand held tools such as hedge trimmers, said device comprising:

a hollow extension pole having a held end and a tool end, said extension pole having an electrical conductor passing through the majority of the length thereof;

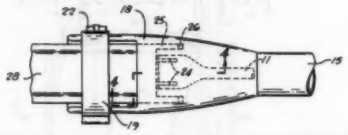
a female plug affixed to the end of the electrical conductor which is nearest the tool end of the extension pole;

a male plug affixed to the other end of the electrical conductor;

first hand grip means attached to the held end of the extension pole;

second hand grip means on the extension pole intermediate its ends;

electrical switch means connected near one of said first and second hand grip means; and



tool gripping means affixed to the tool end of the extension pole, said tool gripping means having strap means moveable from a closed position where it is capable of holding a hand gripping part of a tool to an open position in which the tool may be removed and wherein said tool gripping means includes a recess having an annular groove which surrounds the female plug which is connected to the electrical conductor.

4,515,424

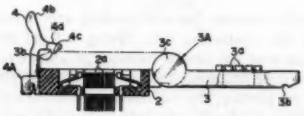
SUPPORT STRUCTURE FOR IC PACKAGE AND HAVING REMOVABLE CLOSURE

Toshihiro Sakurai, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 432,096, Sep. 29, 1982, abandoned. This application Jun. 6, 1983, Ser. No. 501,394

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—75 MP **7 Claims**



1. A supporting structure for an IC package, which comprises:

a socket for receiving an IC package;

a cover member rotatably attached to one end of said socket;

a locking lever member rotatably attached to the other end of said socket for locking the cover member to the socket when the cover member is in the closed position on the socket; and

a first coupling means having:

at least two bearing couplings projecting from one end of one of the socket and one of said members and spaced from each other in the direction of the axis of rotation of said one member and each bearing coupling having a hole therethrough in said direction;

at least two shaft couplings projecting from the base end of the other of the socket and said one member and spaced from each other in said direction and each having a shaft which projects from the side thereof in the said direction; and

at least two keys projecting from the base end of the one of said socket and said one member having the shafts thereon and disposed respectively at the free ends of the shafts;

the two bearing couplings each having a key groove in the circumferential surface thereof parallel to the axes of said holes and adapted to have said keys slidably fitted therein.

4,515,425

IC SOCKET WITH IC PACKAGE PRESSING MEANS

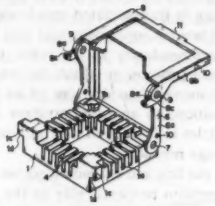
Hidetaka Nakano, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 585,217

Claims priority, application Japan, Feb. 28, 1983, 58-28836[U]

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—75 MP **4 Claims**



1. An IC socket with IC package pressing means, which comprises:

a socket substrate provided therein with contact accommodation grooves, on the upper surface thereof with an attachment portion for attaching an IC package thereto, and on opposite sides of one end thereof with a pair of receiving portions;

an IC package pressing plate having one end thereof link-connected pivotally to the other end of said socket substrate with first pivots as fulcrums to be rotated about said first pivots and raised and laid down relative to the upper surface of said socket substrate, and

an operative lever having one end thereof link-connected pivotally to the other end of said IC package pressing plate with second pivots as fulcrums to be rotated about said second pivots and raised and laid down relative to the upper surface of said IC package pressing plate, and having a pair of engaging claw pieces disposed on the side of said second pivots to extend in a direction opposite to the other end of said operative lever and adapted to collide against and engage with the lower surfaces of said pair of receiving portions of said socket substrate,

whereby said operative lever is rotated about said second pivots in a state wherein the upper surfaces of said pair of engaging claw pieces are brought into collision with the lower surfaces of said pair of receiving portions to be laid down on the upper surface of said IC package pressing plate, and said other end of said IC package pressing plate is given downward force by the rotation of said operative lever to allow said IC package pressing plate to be rotated about said first pivots and laid down on the upper surface of said socket substrate, and thereby said operative lever and said IC package pressing plate are laid down on the upper surface of said socket substrate as overlapping each other with said pair of engaging claw pieces brought into engagement with said pair of receiving portions to press the upper surface of said IC package attached to said attachment portion of said socket substrate.

4,515,426

HEAVY DUTY CLAMPING ELECTRICAL CONNECTOR

Reinhard Bager, House-No. 125, 8999 Ellhofen, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,280

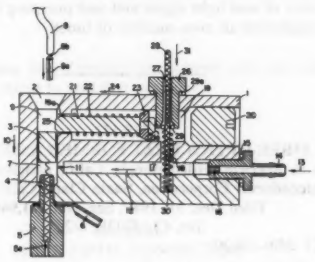
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308178

Int. Cl.³ H01R *13/637*

U.S. Cl. 339—42 **16 Claims**

1. A quickly-connected and detached electrical terminal device of an electric conductor which comprises, a housing, an entry bore defining a latching chamber in said housing for

introducing a bare end portion of the electric conductor therein, said entry bore extending backwardly along said housing to define a control chamber therein; a slidable control element operatively positioned in and normally urged within said bore to a forward position therein for engagement by the bare end portion of the conductor when it is inserted within said bore, and under further inward movement of said end portion of the conductor, for backward movement within said bore; an inlet passageway along said housing connected to a back end of said latching chamber and adapted to receive an operating fluid under pressure, an operating chamber within said housing open at its forward end to said latching chamber forwardly of said control element, a clamping plunger operatively positioned in said operating chamber and normally



urged to a backward position therein, said clamping plunger being adapted for movement into and out of latching engagement with an inserted bare end portion of the conductor, means connecting said inlet passageway to said operating chamber, and said slidable control element having means for diverting fluid flow under pressure from said inlet passageway to said operating chamber when said control element is in a forward position within said bore and for causing fluid flow under pressure from said inlet passageway along said connecting means to said operating chamber for advancing said clamping plunger forwardly into latching engagement with an inserted bare end portion of the electrical conductor when said control element is moved backwardly within said bore by the inserted bare end portion of the conductor.

4,515,427

COAXIAL CABLE WITH A CONNECTOR

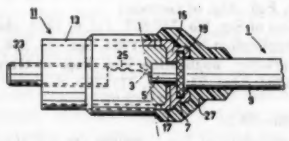
Hermanus Smit, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,408

Claims priority, application Netherlands, Jan. 6, 1982, 8200018

Int. Cl.³ H01R *17/18*

U.S. Cl. 339—177 E **6 Claims**



1. A coaxial cable having a connector permanently attached at one end, comprising

a central cable conductor defining a cable axis,

an intermediate insulating layer surrounding said conductor,

a conducting cable sheath having an end portion of the sheath formed by axial compression into a transverse disk,

a sheath contact electrically connected to said sheath end portion, and

a central contact electrically connected to said central conductor,

characterized in that said sheath contact consists of a one-piece unitary article comprising a transverse wall having at least one substantially planar surface, a coaxial sleeve extending in a first direction from said substantially planar surface and having an edge portion remote from said surface, and a socket portion extending coaxially in the direction opposite said first direction,

said transverse wall extends upwardly from an inner peripheral surface of said socket portion and forms a common wall between the socket portion and the coaxial sleeve,

said transverse wall has a passage therethrough, at least said central conductor passing through said passage,

said transverse disk extends parallel to said substantially planar surface, interiorly of said sleeve, and

said sleeve edge portion is bent inwards to clamp said disc against said surface so as to establish electrical and mechanical connection between the conducting sheath and the sheath contact.

4,515,428

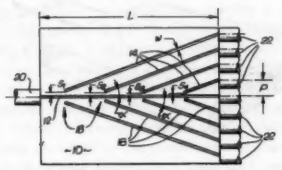
INTEGRATED OPTICAL STAR COUPLER

Talal K. Findakly, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 13, 1982, Ser. No. 417,734

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.12 **8 Claims**



1. A single-mode integrated optical star coupler comprising:

a substrate;

an input single-mode waveguide on said substrate and having an end portion into which input light is launched;

a plurality of output single-mode waveguides on said substrate, each having an output end portion forming an output port, said output end portions being substantially parallel and uniformly spaced in a linear array; and

wherein said input and output single-mode waveguides are coupled together at a plurality of interaction regions at which at least one of said waveguides is located with an end thereof at a preselected spacing from and tilt angle relative to another of said waveguides, the spacing and tilt angles being chosen to effect a predetermined division of power among the output ports.

4,515,429

NONLINEAR AND BISTABLE OPTICAL WAVEGUIDE DEVICES

Peter W. Smith, Colts Neck, and Walter J. Tomlinson, III, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

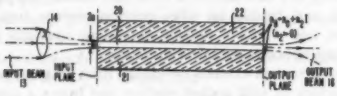
Filed May 27, 1980, Ser. No. 153,255

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.13 **2 Claims**

1. A nonlinear optical device comprising at least two optical materials structurally arranged to provide an optical waveguide having a predetermined length, L, one of said two materials being bounded by the other of said two materials, at least one of said two materials having a dominant nonlinear effect over the length, L, of said waveguide characterized in that said at least one of said two materials has an index of refraction

which changes by $n_2 I$ with changes in light intensity, I, where n_2 is defined as a Kerr coefficient, and the length, L, of said waveguide is less than L_R, the threshold length for stimulated Raman scattering, which is approximately $16/gI_c$, where I_c is



the light intensity at which the index of refraction of said at least one of said two materials equals the index of refraction of the other of said two materials, and g is the peak Raman gain for said at least one of said two materials.

4,515,430

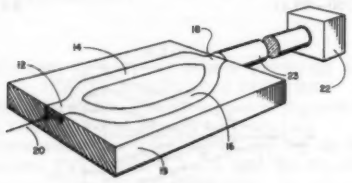
INTEGRATED OPTICAL TRANSDUCERS

Leonard M. Johnson, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 187,041, Sep. 15, 1980, abandoned. This application Jun. 10, 1983, Ser. No. 502,348

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.13 **20 Claims**



3. An optical transducer for measuring a physical quantity comprising:

a single mode input optical waveguide for transmitting an optical signal;

at least two single mode optical waveguide branches having different physical lengths and in which said optical signal diverges, the difference in physical lengths being many times greater than the wavelength of the optical signal and the optical path length of each branch being a function of said physical quantity;

an output optical waveguide into which the optical signals reconverge; and

means for providing an indication of the modal power distribution in the output optical waveguide as an indication of said physical quantity.

4,515,431

FIBER OPTIC AMPLIFIER

Herbert J. Shaw; Marvin Chodorow, both of Stanford, and Michel J. F. Digonnet, Menlo Park, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 11, 1982, Ser. No. 407,136

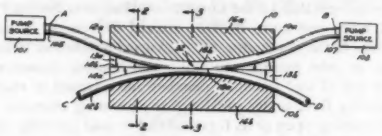
Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.15 **14 Claims**

10. A fiber optic amplifier, comprising:

first and second strands of single-mode fiber optic material, one of said strands formed of material which will lase, said first strand having an end portion for coupling said first strand to a source of a light signal to be amplified, said second strand having an end portion for coupling said second strand to a source of pumping illumination for said material which will lase; and

means for accurately positioning said strands together in close facing relationship to form a planar region of interaction in which said light signal and said pumping illumination within said strands interact through their evanescent fields to cause one of said light signal and said pumping illumination to be transferred between the core portions of the strands an odd number of times, while the other of said light signal and said pumping illumination is transferred an even number of times.



4,515,432

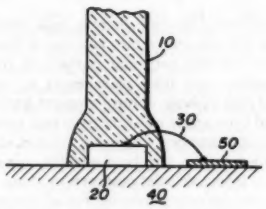
FIBER OPTICS HEAT FORMED ASSEMBLY

James S. Sherwin, Hillsborough, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 31, 1980, Ser. No. 221,948

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **2 Claims**



1. A fiber optical assembly comprising an optical fiber attached to an optical device by melting one end of the optical fiber, pressing the melted fiber against the optical device, and cooling the assembly.

4,515,433

COUPLING ARRANGEMENT FOR OPTICAL WAVEGUIDES AND METHOD OF MANUFACTURING THE SAME

Bernhard Schmidt, Neunkirchen, Fed. Rep. of Germany, assignor to Felten & Guilleaume Carlswerk Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 280,507, Jul. 6, 1981, abandoned. This application Mar. 30, 1984, Ser. No. 596,153

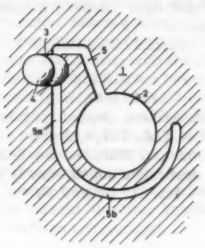
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025384; Mar. 21, 1981, 3111267

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.21 **8 Claims**

1. An arrangement for coupling optical waveguide ends mounted in respective connectors, comprising a housing body having at least one first passage dimensioned for receiving the connectors of the optical waveguide ends in an end-to-end alignment, and at least one second passage parallel to and coextensive with said first passage; means for defining in said housing body at least one slot interconnecting said first and second passages and extending along an arcuate course therebetween to partially separate a clamping portion situated between said first and second passages from the remainder of the

housing body; and a plurality of pressing bodies accommodated in said second passage and operative for pressing said



clamping portion into clamping engagement with the connectors accommodated in said first passage.

4,515,434

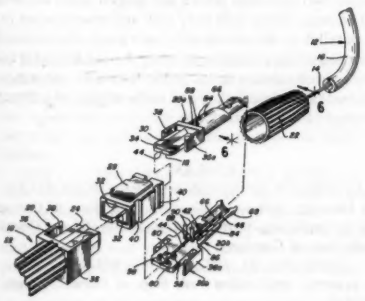
FIBER OPTIC CONNECTOR

Mark Margolin; Igor Grois, both of Lincolnwood; Peter K. Herdeg, Forest Park, and John P. Nijman, Wheaton, all of Ill., assignors to Allied Corporation, Morris Township, N.J.

Filed Mar. 9, 1983, Ser. No. 473,415

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 **35 Claims**



1. A fiber optic connector for optically coupling a pair of fiber optic cables or coupling a single fiber optic cable and a light source or detector, said cable having an outer coating about an inner fiber core, comprising: a terminal member defined by a pair of matching halves having complementary groove means defining a through hole extending axially therethrough, said through hole having a first portion extending between forward mating end portions of said matching halves and sized to snugly receive a length of said fiber core stripped of said outer coating and properly positioning said core with respect to the mating end of the terminal member, said through hole having a second portion extending between rear end portions of said matching halves and sized for receiving said outer coating of said fiber optic cable, means in said second portion of said through hole for clamping said outer coating to prevent lengthwise movement of said fiber optic cable relative to said terminal member, and means positionable over said rear ends of said matching halves for biasing said clamping means against said outer coating of said fiber optic cable.

4,515,435

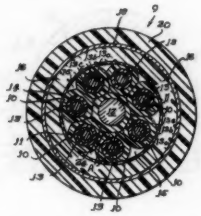
THERMALLY STABILIZED FIBER OPTIC CABLE

Gene S. Anderson, Elburn, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 10, 1982, Ser. No. 406,777

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.23 **20 Claims**



1. A fiber optic cable for directly transmitting a visible optical signal comprising

a plurality of relatively large diameter optical fibers each having a light-transmitting core and means therearound providing an interface that reflects incident light back into said core,

a sheathing layer of elastomeric polymeric material around each optical fiber in intimate contact with the outer surface of said optical fiber, said elastomeric polymeric material being resiliently compressible, having a modulus of elasticity of between about 63 and about 78 kg/cm^2 at 23° C., having a Shore A of between about 64 and about 68 at 23° C., 10 sec and having a dynamic temperature range of from about −20° C. or below to about 105° C. or above,

an axial core including a rigid, substantially non-compressible axial member having a coefficient of thermal expansion closely matched to the coefficient of thermal expansion of said optical fibers, said axial core being located along the center axis of the cable and extending longitudinally along the center axis of the cable, said sheathed optical fibers being cabled around said axial core in a lay length of between about 15 and about 50 cm,

said sheathing layers being compressed against said axial core to be deformed thereby over an extended surface contact with the axial core, said sheathing layers being compressed against adjacent sheathing layers to be deformed from a circular cross section, and

a jacket surrounding said sheathed fibers formed of polymeric material substantially more rigid than said elastomeric polymeric material having a Shore D of between about 34 and about 39 at 23° C., 10 sec and a dynamic temperature range of from about −20° C. or below to about 105° C. or above, said sheathed fibers being held in compression against said axial core by said jacket, whereby said axial core stabilizes said polymeric material layers against differential thermal expansion and contraction relative to said optical fibers.

4,515,436

SINGLE-MODE SINGLE-POLARIZATION OPTICAL FIBER

Richard E. Howard, Holmdel; William Pleibel, Matawan; Jay R. Simpson, Fanwood, and Rogers H. Stolen, Rumson, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 4, 1983, Ser. No. 464,059

Int. Cl.³ G02B 5/14, 5/172

U.S. Cl. 350—96.33 **17 Claims**

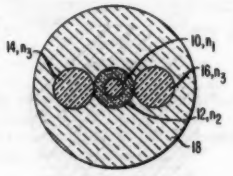
1. An optical fiber for propagating a single polarization of a single mode wave comprising

a central core region comprising a first refractive index (n_1);

a cladding layer surrounding the central core region and

comprising a refractive index (n_2) less than said refractive index of said central core region;

a surrounding region formed in intimate contact with said cladding layer and comprising a refractive index (n_3) greater than said refractive index of said cladding layer and less than said refractive index of said central core region; and



means for inducing a stress birefringence capable of separating said single mode wave into a pair of orthogonally polarized waves wherein a first orthogonally polarized wave is propagated down said central core region and a second orthogonally polarized wave is attenuated by tunneling through said cladding layer.

4,515,437

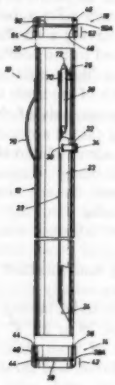
APPARATUS FOR FACILITATING VISUAL METER READINGS

Allan Story, P.O. Box 310, Houston, Tex. 77036

Filed May 11, 1983, Ser. No. 493,436

Int. Cl.³ G02B *5/00*

U.S. Cl. 350—114 **9 Claims**



1. Apparatus for facilitating readings from a meter face by a human observer, comprising:

(a) center tube means, having a proximal end and a distal end, for providing a shaded viewing path therethrough between said observer and said meter face;

(b) distal end cap assembly means disposed about said distal end of said center tube means for sealing off said center tube means at said distal end and permitting said viewing of said meter face therethrough, said distal end cap assembly means including

a distal lens cap; and

a distal lens disposed within said distal lens cap, said distal lens cap including

a distal spacer means for abutting engagement with said meter face and for providing spacing between said meter face and said distal lens upon said abutting engagement;

(c) a light assembly means internal of, and carried by, said center tube means for illuminating said meter face; and

(d) pivotal mounting means interconnecting said center tube means and said light assembly means for retainedly adjusting the position of said light assembly means relative to said center tube means.

4,515,438

LENS BARREL

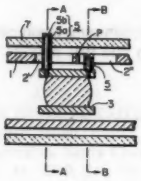
Mitsuo Ohnuki, Sagamihara, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,918

Claims priority, application Japan, Apr. 1, 1981, 56-47250

Int. Cl.³ G02B *7/04*

U.S. Cl. 350—255 **5 Claims**



1. A lens barrel comprising a movable frame which is displaceable in a direction of an optical axis while being guided by a guide frame, a first set of engaging members, a second set of guide slots each engaged with a corresponding one of said engaging members, wherein one of said sets is provided on the movable frame and the other set is provided on the guide frame, said engaging members and guide slots being provided at more than two locations which are spaced apart circumferentially at an angle other than only 180° and spaced apart in the direction parallel to the optical axis, said guide slots extending in the direction of the optical axis, whereby the movable frame is held and guided relative to the guide frame for movement in the direction of the optical axis, and without play in a direction at a right angle to the optical axis.

4,515,439

ATTACHMENT OF MICROSCOPE OBJECTIVES

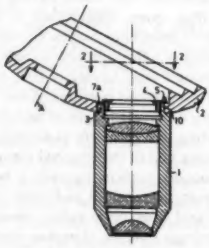
Karlheinz Esswein, Aalen-Unterkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,860

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202461

Int. Cl.³ G02B *7/02*; F16D *1/00*

U.S. Cl. 350—257 **15 Claims**



1. In combination, a microscope having an objective mount on an objective axis, and an objective having a housing adapted

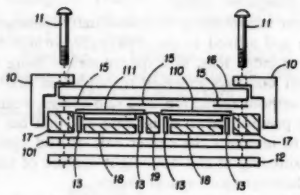
at one end for detachable assembly to said mount in centered relation to said axis, said mount being characterized by angularly spaced concave conical seat portions of a single geometric cone that is concentric with said axis, thereby establishing angularly spaced axial passages between said seat portions, said one end of said objective housing being characterized by a circumferentially continuous convex conical seat conforming to said geometric cone and coaxial with the axis of said objective, said convex conical seat being near but at axial offset from said one end, and radially outward bayonet-locking lugs at said one end of said objective housing, said lugs being radially and angularly limited to permit axial insertion of said one end into said mount and via said passages to the extent limited by convex-to-concave conical-surface engagement, and said mount being adapted to accept locking engagement with said lugs upon partial rotation of said objective housing in said mount when said conical surfaces are engaged.

4,515,440

MOUNTING STRUCTURE FOR MULTIPLE LIQUID CRYSTAL DISPLAYS

Donald E. Mosier, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 28, 1983, Ser. No. 489,652
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—334 **3 Claims**



1. A liquid crystal display apparatus comprising:

a. a plurality of liquid crystal displays disposed in a proximal coplanar configuration, each display having an annunciator region on a viewing surface thereof and a plurality of electrical contacts on a surface opposite said viewing surface;

b. a mask in contact with said viewing surfaces in regions opposite said electrical contacts and voided in regions corresponding to said annunciator regions;

c. a printed circuit board providing structural support for said apparatus and electrical communication thereto disposed in a parallel relationship with said liquid crystal displays;

d. a plurality of elastomeric connectors intermediate said printed circuit board and said liquid crystal displays providing electrical contact there between; and

e. a cover window in contact with said mask on a surface thereof opposite said liquid crystal displays and further having securing means for rigidly attaching said liquid crystal displays, elastomeric connectors, and mask to said printed circuit board.

4,515,441

DIELECTRIC POLARIZER FOR HIGH AVERAGE AND HIGH PEAK POWER OPERATION

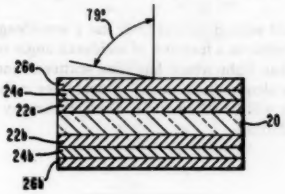
John L. Wentz, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 13, 1982, Ser. No. 434,191
Int. Cl.³ G02B *5/30*
U.S. Cl. 350—395 **6 Claims**

1. An optical polarizer which operates at high peak and average power density operation, with a high Brewster angle of greater than 75 degrees for incident radiation to permit such operation without damage to the polarizer, with the efficiency of transmission of the polarized radiation being greater than about 95%, and the efficiency of reflection for the orthogonally polarized radiation being greater than about 95%, which polarizer comprises;

an optically transmissive substrate having a predetermined index of refraction,

a plurality of quarter wavelength thick optically transmissive dielectric parallel layers disposed on at least one side of the substrate, with a first dielectric layer disposed on the substrate and having a high index of refraction relative to the substrate, with a second dielectric layer atop the first layer and having a relatively low index of refraction relative to the index of the first dielectric layer, and a third dielectric layer atop the second layer which third comprises the same dielectric material as the first layer.



4,515,442

OPTICAL FILTER DEVICE

Mitchell Aron, Harrington Park, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 1, 1982, Ser. No. 344,658
Int. Cl.³ G02B *5/20*; H04N *5/72*
U.S. Cl. 350—397 **7 Claims**

1. An optical filter device passing therethrough in a specified direction light having predetermined wavelengths within a predetermined range of incidence angles while substantially blocking light which originally is travelling in the opposite direction to said specified direction and is reflected back to travel in said specified direction, from passing therethrough comprising:

a first optical filter for converting light passing therethrough in said opposite direction to a first predetermined sense, said first optical filter substantially passing only light having said first sense;

a second optical filter, in a cooperative relationship with said first optical filter, which passes light within a specified range of wavelengths and rejects light having wavelengths other than said specified range of wavelengths, said specified range of wavelengths shifting in accordance with the angle of incidence of the light and the design of said second optical filter, wherein light travelling opposite

to said specified direction passes first through said first optical filter and is converted to said first predetermined sense before impinging upon said second optical filter, and wherein the first predetermined sense light, having wavelengths other than said predetermined wavelengths of light, is reflected from said second optical filter and is thereby converted to a second predetermined sense wherein it is unable to pass back through said first optical filter;

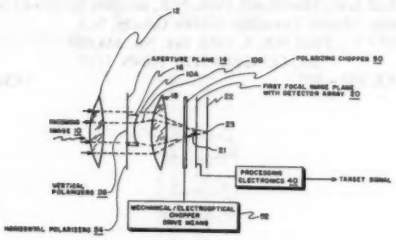
wherein said second optical filter has a wavelength shifting characteristic as a function of incidence angle sufficient to ensure that, light which has been scattered and reflected and is incident on said second optical filter in the specified direction will be substantially blocked thereby as a result of said shifting.

4,515,443

PASSIVE OPTICAL SYSTEM FOR BACKGROUND SUPPRESSION IN STARRING IMAGERS

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 29, 1982, Ser. No. 454,305
Int. Cl.³ G02B *27/28*
U.S. Cl. 350—396 **19 Claims**



1. A passive optical system for background suppression in staring array imagers, said system comprising:

a dual focus objective lens and polarizing means for providing a linearly polarized image in a first focal image plane and an opposite linearly polarized image in a second focal image plane;

a detector array positioned in said first focal image plane closest to said objective lens for receiving a sharp focused linearly polarized image of a high spatial frequency feature target and low spatial frequency background therein and an unsharp defocused opposite linearly polarized image in said second focal image plane which contains a blurred image of said high spatial frequency feature target and an image that contains a faithful reproduction of said low spatial frequency background as in said sharp focused linearly polarized image in said first focal image plane, said focused and defocused images received in each pixel site of said detector array;

difference sensing means for sensing said focused and defocused images at each pixel site to provide output signals proportional to the difference between said focused and defocused opposite linearly polarized images; and

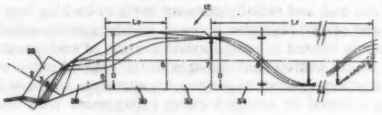
means for electronically processing said output signals from each of said pixel sites to algebraically subtract said backgrounds and produce an enhanced contrast target signal for said staring array imager.

4,515,444

OPTICAL SYSTEM

Rochelle Prescott, Arlington, and Dennis C. Leiner, Andover, both of Mass., assignors to Dyonics, Inc., Andover, Mass.

Filed Jun. 30, 1983, Ser. No. 509,946
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—413 **20 Claims**



1. An optical system comprising

at least two gradient index lenses of predetermined diameter, and spacer means between said lenses for increasing the light throughput transmitted through said lenses by substantial maximization of the optical invariant of said system,

the image transmitted through said system being represented by a chief ray and an axial ray,

a first said gradient index lens disposed uplight of said spacer means having a length preselected whereby at the downlight surface of said first lens a first of said rays has a slope of essentially zero and a second of said rays has a negative slope,

said spacer means being of substantially homogeneous substance and affixed to the downlight surface of said first gradient index lens, said spacer means being adapted to transmit said rays received through said first lens essentially without refraction, and said spacer means having a length preselected to cause said ray that has a negative slope to intersect the center axis of said optical system approximately at the downlight surface of said substantially homogeneous spacer means,

a second said gradient index lens affixed to the downlight surface of said substantially homogeneous spacer means, the transmitted image received at the first surface of said second gradient index lens thereby having a height substantially approaching the radius of said optical system,

whereby the optical invariant of said second gradient index lens is substantially maximized for increased light throughput.

4,515,445

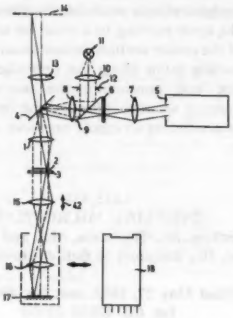
OPTICAL SYSTEM FOR TRANSMITTED-LIGHT MICROSCOPY WITH INCIDENT ILLUMINATION

Gerhard Müller, Aalen, and Jürgen Schwarz, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 460,036
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204686
Int. Cl.³ G02B *21/06*
U.S. Cl. 350—524 **8 Claims**

1. An optical system for microscopy on light-transmitting objects having a retroreflection device by which the light coming from an incident-light illuminating device and transmitted by the object is reflected back onto the rear side of the object, characterized by the fact that the retroreflection device contains an optical system (15–17; 35–37) which images the object, unreversed and upright, on itself, and further character-

ized by the fact that the optical system comprises at least one objective arranged between the object (3) and a flat mirror

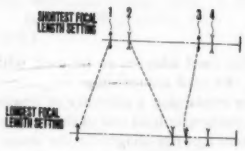


(17), said objective imaging the object and the mirror one on the other.

4,515,446
ZOOM OBJECTIVE

Sadatoshi Takahashi, Tokyo; Sadahiko Tsuji, Kanagawa; Akira Tajima, Kanagawa; Toshiaki Asano, Kanagawa, and Setsuo Minami, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,122
Claims priority, application Japan, Dec. 29, 1981, 56-212994
Int. Cl.³ G02B *15/16*
U.S. Cl. 350—427 **5 Claims**



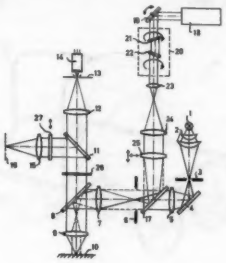
1. A zoom objective comprising:
from front to rear, a first positive lens component, a second negative lens component, a third positive lens component and a fourth lens component;
said first, second and third lens components moving independently of one another when zooming, and said fourth lens component being held stationary during zooming;
said first and third lens components lying more toward the front when in the telephoto side than when in the wide angle side, and said second lens component lying more toward the rear when in the telephoto side than when in the wide angle side; and
said second lens component being arranged to move in such a way that its magnification power varies to exceed unity.

4,515,447
OPTICAL ADJUSTMENT DEVICE

Eugen Weimer, Essingen, and Gerhard Müller, Aalen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,213
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214268
Int. Cl.³ G02B *27/12, 7/18, 27/17*
U.S. Cl. 350—527 **11 Claims**

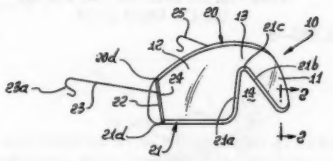
1. An optical adjustment device comprising two transparent parallel plates which are inclined relative to an optical axis, both of said plates (21, 22) being mounted for rotation around said optical axis with constant angle of inclination relative to said optical axis, and means for coupling a monochromatic parallel beam of rays into an optical microscope, said coupling means including an expansion lens system (23, 24) and a displaceable intermediate lens (25) which focuses the beam of rays in an image plane (6) which is conjugated to an object plane (10) of the microscope, said parallel plates being located in said beam of rays between a source thereof and said expansion lens system.



4,515,448
SUNGLASSES

George Tackles, Livermore, Calif., assignor to Oakley, Inc., Irvine, Calif.

Filed Mar. 28, 1983, Ser. No. 479,836
Int. Cl.³ G02C *7/00, 7/16, 7/12*
U.S. Cl. 351—41 **7 Claims**



1. In protective eyeglasses having left and right sides, the combination comprising
(a) transparent panes located to extend in the path of the wearer's field of vision, frontwardly and sidewardly,
(b) said panes shaped frusto-conically,
(c) said panes merging together at a bridge region adapted to extend over the wearer's nose, thereby to define one pane which extends continuously and generally frusto-conically across the wearer's field of vision between said left and right sides,
(d) and including a top frame bounding upper edges of said panes, and a bottom frame bounding lower edges of said panes, said frames being removable from said panes, and being everywhere spaced apart between said left and right sides, and also at said bridge region.

4,515,449
HEAD HARNESS FOR GLASSES

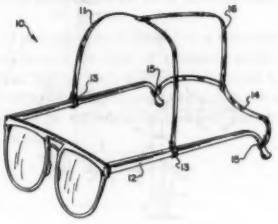
Katharine H. Davidson, 74 E. 2500 North, Vernal, Utah 84078

Filed Feb. 16, 1983, Ser. No. 467,148
Int. Cl.³ G02C *3/00*
U.S. Cl. 351—156 **1 Claim**

1. A head harness for eyeglasses comprising:
a first elongated strap in a preadjusted length position for engagement over the head of a person, said elongated

strap containing closed loops at each end for engaging the midsections of respective temples of a pair of eyeglasses;

a second elongated strap in a preadjusted length position for engagement around the rear of the head of a person, said elongated strap containing closed loops at each end for engaging the back ends of respective temples of a pair of eyeglasses; and



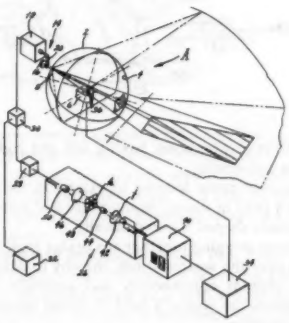
an elongated strap in a preadjusted length, said strap sewn at one of its ends to the mutually respective midsections of the first and second elongated straps, whereby the said straps provide a harness extending from the midsections of eyeglass temples over a user's head, from the free ends of eyeglass temples around the back of a user's head and from the midsections of the first and second straps across the top rear of a user's head.

4,515,450

TRANSPARENCY FOR USE WITH A FLYING SPOT SCANNER TO GENERATE IMAGES

Ignacio M. Arrazola, Barranquilla, Colombia, assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 428,169
Int. Cl.³ G03B *21/28*
U.S. Cl. 353—5 **12 Claims**



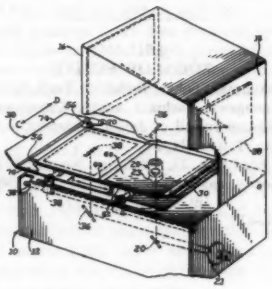
1. In combination with an apparatus for visually simulating flight and including a source of light which is designed to be projected on and to scan over an illustration of terrain or simulated terrain, the source of light being capable of indexing instantaneously from one region of the illustration to another region, and means for producing an image of the region of the illustration illuminated by the source of light, an improved illustration of the terrain positioned where the source of light will illuminate it and may scan over it, said illustration comprising: a center section having opposite boundaries along which the terrain features generally correspond so that the two opposite boundaries if brought together will illustrate continuous terrain features, and peripheral side sections located along the opposite boundaries of the center section, each peripheral side section along that of its boundaries where it is contiguous to the center section having terrain features that correspond with the terrain features along the adjacent boundary of the center section, so that the peripheral side sections blend into the center section at the common boundaries between the center and peripheral side sections, the illumination from the source of light upon moving to a point on one of the opposite boundaries of the center section, instantaneously transposing to the corresponding point along the opposite boundary of the center section and continuing the movement therefrom through the center section, whereby the image produced by the means for producing an image provides an illusion of continuous flight.

4,515,451

INDEXING MICROFILM

Harold H. Benham, Jr., Timonium, Md., and Thomas R. Wells, Des Plaines, Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 27, 1983, Ser. No. 498,619
Int. Cl.³ G03B *23/08*
U.S. Cl. 353—120 **9 Claims**



1. A microfilm card adapted to be used with a microfilm reading device, the card comprising:

an image area containing a plurality of images arranged in rows and columns, at least one of the images containing an expanded index of the images on the image area,

a translucent index area adjacent to the image area containing indexes thereon,

the index area precisely and accurately positioned with respect to the image area,

the indexes relating to their respective expanded index on the image area and viewable directly by a person using the device without the need for magnifying or projecting on a screen the index while the related expanded index is viewable on the reading device, and

a pair of tab members extending outward from the card, the tab members adapted to be received by upstanding locating pins on the microfilm reading device, whereby the tab members and the upstanding locating pins cooperate to accurately and positively position the microfilm card in the same precise location each time it is to be viewed.

4,515,452

DATA INSERTING DEVICE FOR CAMERA

Hiroyoshi Tsuzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,662
Int. Cl.³ G03B *17/24*; H05B *37/03*
U.S. Cl. 354—106 **11 Claims**

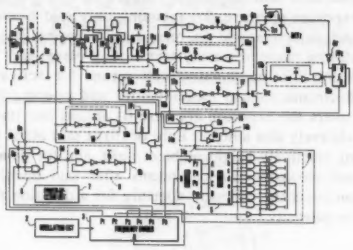
1. A data inserting device for a camera, comprising:

data inserting circuit means;

transmitting means for transmitting a data insertion trigger signal from a camera body to said data inserting circuit means;

display means for displaying data on the outside of the camera; and

abnormity detecting means which supplies a current to said transmitting means and detects an abnormity by a change



of impedance occurred at said transmitting means, said abnormity detecting means being arranged to indicate that data insertion is impossible by varying the display state of said display means when an abnormity is detected.

4,515,453

CAMERA HAVING A FLASH UNIT BUILT THEREIN

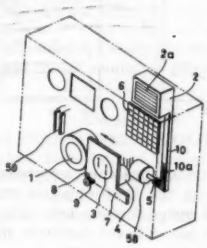
Hiroshi Wakabayashi, Yokohama; Nobuo Okabe, Tokyo, and Koichi Daitoku, Sagamihara, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,718

Claims priority, application Japan, May 14, 1983, 58-83502

Int. Cl.³ G03B *15/03, 3/00*

U.S. Cl. 354—149.1 **9 Claims**



1. A camera for exposing a film to the image of an object to be photographed, including:

(a) housing means;

(b) flashlight emitting means having a light-emitting portion for applying light toward the object to be photographed, said light-emitting portion being movable between a first position in which it is projected from said housing means and a second position in which it is received in said housing means; and

(c) an optical member provided in said housing means so as to be positioned between said light-emitting portion and the object to be photographed when said light-emitting portion is in said second position, said member having an optical characteristic for an area in which light is applied to the object to be photographed from said light-emitting portion through said optical member to change relative to an area in which light is directly applied to the object to be photographed from said light-emitting portion.

4,515,454

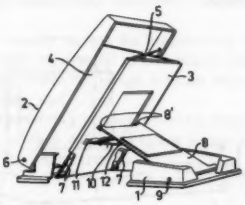
FOCUSING HOOD FOR CAMERAS

Lennart G. O. Dahlgren, V. Frölunda, Sweden, assignor to Victor Hasselblad Aktiebolag, Gothenburg, Sweden

Filed Sep. 28, 1983, Ser. No. 536,857

Int. Cl.³ G03B *11/04*

U.S. Cl. 354—287 **7 Claims**



1. A focusing hood for a camera having a box comprising a cover hingedly attached to the camera box and adapted to be folded-up, and a lateral piece and a back piece mounted to the cover, the lateral piece being divided into a front lateral piece portion and a rear lateral piece portion pivotally connected to said front lateral piece portion, and the back piece pivotally connected to said rear lateral piece portion and connected to the box by a link hinged at the box and back piece, characterized in that the link comprises a first link portion hingedly mounted at the box, and a second link portion hingedly mounted on the back piece at a level vertically beneath the center of the back piece, and said second link portion being hingedly mounted to the first link portion at a pivot point substantially on a level at half the height of the back piece when said first link portion is substantially perpendicular to said back piece.

4,515,455

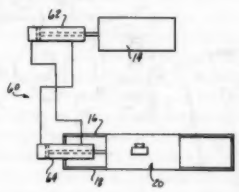
CAMERA MOVEMENT SYNCHRONIZING APPARATUS

James E. Northmore, 28207 Grand Duke Dr., Farmington Hills, Mich. 48018

Filed Apr. 4, 1983, Ser. No. 481,729

Int. Cl.³ G03B *15/00*

U.S. Cl. 354—293 **2 Claims**



1. An apparatus for synchronizing movement of a camera with movement of an object to be photographed to be comprising:

a horizontal track disposed parallel to the path of movement of the object;

means for movably mounting a camera on the track; and

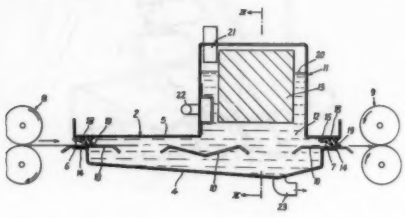
pressure energy transfering means, connected between the object and the camera mounting means and responsive to displacement of the object, for transfering a flow of fluid pressure upon displacement of the object to cause a direct linear displacement of the camera mounting means.

4,515,456

TANK FOR THE TREATMENT OF OFFSET PLATES BY ULTRASOUNDS

Mario Ferrante, Maxeville, France, assignor to Photomeca S.A., Maxeville

Filed May 15, 1984, Ser. No. 610,578
Claims priority, application France, Jun. 2, 1983, 83 09144
Int. Cl.³ G03B *3/04*
U.S. Cl. 354—320 **10 Claims**



1. A tank incorporating an ultra-sound generator for the treatment, in a bath of developer stirred by ultra-sounds, of plates with photosensitive layer passing through this bath,

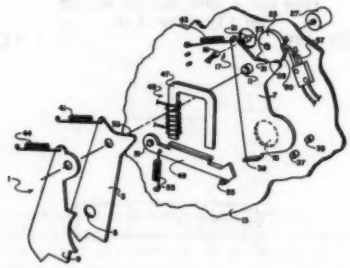
wherein it comprises an elongated rectilinear passageway having a lower wall and an upper wall containing therebetween the developer bath, with an inlet opening at one end and an outlet opening at the opposite end, these openings being spaced apart by a length shorter than the length of the shortest plate to be treated, at least one supple lip seal being disposed in each of these openings, at least one bath reservoir containing the ultra-sound generator being in communication with this elongated rectilinear passageway by a communicating opening, means for propelling the plates along the passageway being placed near the inlet and outlet openings.

4,515,457

EXPOSURE CONTROL MECHANISM

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1984, Ser. No. 611,578
Int. Cl.³ G03B *7/097, 9/00*
U.S. Cl. 354—443 **8 Claims**



1. In a camera of the type provided with (a) a diaphragm for reducing the effective size of an exposure aperture, (b) a shutter including an opening blade for uncovering the exposure aperture and a closing blade for re-covering the exposure aperture, and (c) means for urging said diaphragm to reduce the effective size of the exposure aperture and for urging said opening and closing blades to uncover and re-cover the exposure aperture, the improvement comprising:

electromechanical means, including a single electromagnet, activatable alternatively (i) at one time before said diaphragm reduces the effective size of the exposure aperture, for retaining said diaphragm and said closing blade to prevent said diaphragm from reducing the effective size of the exposure aperture and to prevent said closing blade from re-covering the exposure aperture, or (ii) at another time after said diaphragm reduces the effective size of the exposure aperture, for retaining only said closing blade, and de-activatable to release said diaphragm and said closing blade or merely said closing blade; and

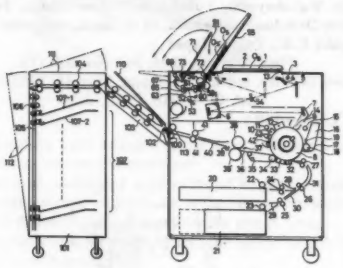
ambient light-regulated circuit means for activating said electromechanical means before said opening blade uncovers the exposure aperture (i) at said one time during relatively dim ambient light or (ii) at said other time during relatively bright ambient light, and for de-activating said electromechanical means after said opening blade uncovers the exposure aperture for a duration related to the intensity of ambient light.

4,515,458

IMAGE FORMING APPARATUS

Shunichi Masuda, Tokyo; Toshiaki Yagasaki, Hino, and Yukio Kasuya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,166
Claims priority, application Japan, May 21, 1981, 56-75641; May 21, 1981, 56-75642
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **8 Claims**



1. An image forming apparatus comprising:

an image forming unit for forming an image on a record medium, said image forming unit being operable in selected one of two different operation modes to form the image on said record medium, said operation modes of said image forming apparatus comprising a first mode for exposing while an original is moved and a second mode for exposing while the original is fixed;

an accommodation unit having a plurality of bins for distributing and accommodating therein record medium fed from said image forming unit, said accommodation unit being operable in selected one of two different operation modes to distribute and accommodate said record medium, said operation modes of said accommodation unit comprising a collator mode for accommodating the record medium sequentially in one bin and a sorter mode for accommodating the record medium in different bins for each record medium; and

control means for selecting the operation mode of said accommodation unit in accordance with the operation mode selected for said image forming unit, wherein said control means selects said collator mode for said accommodation unit when said first mode is selected for said image forming unit.

4,515,459
PRESS FIXING APPARATUS WITH THREE PRESSING ROLLERS

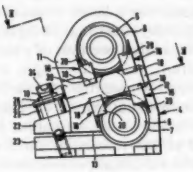
Kurt Moser, Gerlingen, and Rolf Hofmann, Leonberg, both of Fed. Rep. of Germany, assignors to Develop Dr. Eisbein GmbH & Co., Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,036

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212147

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 FU **20 Claims**



1. Pressing roller arrangement for the fixing of toner images in a photocopying machine, or the like, comprising:

three pressing rollers disposed in substantially a common plane and forming clamping gaps for accommodating travel therethrough of paper or foil and the like, said pressing rollers including two outer pressing rollers and a middle pressing roller,

and a common bearing block at each respective end of the rollers, said bearing blocks forming resiliently biased bearing seats for the outer pressing rollers and being provided with a guide for the bearing of the middle pressing roller,

wherein the bearing blocks are formed as respective unitary building parts which exhibit two oppositely disposed somewhat half cylindrical bearing seats for the bearings of the outer pressing rollers,

one of the bearing block portions forming the respective bearing block being divided into two sections with a separating slot therebetween, and wherein at least one spring is provided for resiliently tensioning said sections with respect to one another at said slot.

4,515,460
DEVICE FOR TRANSFERRING COLOR TONER IMAGES

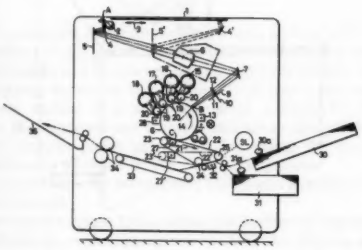
Wilhelm Knechtel, Biebertal, Fed. Rep. of Germany, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1983, Ser. No. 487,136

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214677

Int. Cl.³ G03G *15/01, 15/16*

U.S. Cl. 355—3 TR **4 Claims**



1. A device for transferring toner images onto an image transfer material which comprises:

(a) a latent image holding member;

(b) latent image forming means for forming electrostatic latent images on said latent image holding member;

(c) developing means for toner-developing the electrostatic latent images formed on said latent image holding member;

(d) an intermediate image transfer member, onto which a plurality of toner images developed by said developing means are sequentially transferred in superposed relationship;

(e) image transfer means for transferring the plurality of toner images transferred to said intermediate image transfer member onto an image transfer material in a single transfer step; and

(f) means for moving said intermediate image transfer member into contact with said latent image holding member only during image transfer.

4,515,461
APPARATUS FOR TRANSFERRING ELECTROPHOTOGRAPHIC IMAGES

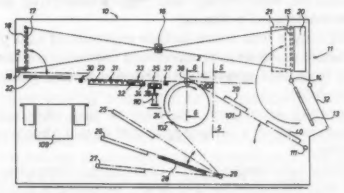
Leo N. Vackier, 's-Gravenwezel, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed May 25, 1983, Ser. No. 498,156

Claims priority, application United Kingdom, May 26, 1982, 8215316

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **13 Claims**



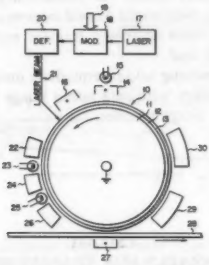
1. Apparatus for transferring an electrophotographic toner image from the surface of a first image-donating element to the surface of a second image-receiving element, said apparatus comprising a rotatable member having a cylindrically curved periphery for supporting one of said elements in cylindrically curved condition, concentric with the axis of rotation of said rotatable member, and means for conveying the other element, synchronously with said one element, through an image transfer station traversed by the path of motion of said curved periphery of said rotatable member, said station comprising means for forming an electrical potential gradient for effecting such toner image transfer, said conveying means comprising a bodily displaceable carriage having a holder for holding said one element in substantially flat condition; means for guiding said carriage for movement along a path extending in close spaced proximity to said rotatable member for conveying said one element through the image transfer station; and spacer strips of predetermined thickness located adjacent the lateral end edges of one of the cylindrically curved periphery of said rotatable member or the flat surface of said sheet holder for making contact at the image transfer station with the other of said holder surface or said rotatable member periphery and thereby establish a predetermined gap between the said image-donating and image-receiving surfaces; and means for biasing said holder toward said member periphery to maintain said spacer strips under contact pressure during passage through the image transfer station.

4,515,462

METHOD AND APPARATUS FOR FORMING MULTICOLOR IMAGE

Hitoshi Yoneda, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1983, Ser. No. 469,753
Claims priority, application Japan, Feb. 26, 1982, 57-29949
Int. Cl.³ G03G *13/01, 15/01*
U.S. Cl. 355—4 **18 Claims**



4. A method for forming an n-color image, comprising the steps of:

performing primary charging of a first polarity for a photoconductive drum having a conductive substrate, and a photoconductive layer and a transparent insulating layer formed on said conductive substrate, thereby producing a carrier of a first polarity on said transparent insulating layer and a carrier of a second polarity in said conductive substrate, and setting said photoconductive drum at a predetermined potential;

performing a first entire-surface exposure of said photoconductive drum so as to move said carrier of a second polarity from said conductive substrate to said photoconductive layer;

performing secondary charging of said photoconductive drum to invert a surface potential of said photoconductive drum;

radiating light beams onto n color image formation portions of said photoconductive drum, inverting a potential of a first surface portion of said photoconductive drum to a potential of the first polarity, and setting a potential of remaining surface portions of said photoconductive drum to a potential of the second polarity at a predetermined potential, said light beams having light amount levels corresponding to n-color image data, said first surface portion corresponding to a first color image formation portion, said remaining surface portions corresponding to (n−1) color image formation portions;

applying a first color toner of the second polarity to said first surface portion of said photoconductive drum, and developing the first color image;

performing a kth (k=2, . . . , n) entire-surface exposure of said photoconductive drum to set a kth surface portion of said photoconductive drum at a potential of the first polarity; and

applying a kth color toner of the second polarity to said kth surface portion of said photoconductive drum, and developing the kth color image.

13. An apparatus for forming an n-color image, comprising:

a photoconductive drum which has a conductive substrate, and a photoconductive layer and a transparent insulating layer sequentially formed on said conductive substrate;

first charging means disposed at a predetermined position above said photoconductive drum to perform primary charging, thereby producing a carrier of a first polarity on said transparent insulating layer and a carrier of a second polarity in said conductive substrate, and setting said photoconductive drum at a predetermined potential;

first light source means disposed in front of said first charging means along a rotational direction of said photoconductive drum to expose an entire surface of said photoconductive drum, thereby transferring said carrier of a second polarity from said conductive substrate to said photoconductive layer;

second charging means disposed in front of said first light source means along the rotational direction of said photoconductive drum to secondarily charge said photoconductive drum at the second polarity;

second light source means disposed in front of said second charging means along the rotational direction of said photoconductive drum to emit light, an amount of which is controlled to have n levels in accordance with n-color image data, thereby radiating the light onto n prospective color image formation portions of a surface of said photoconductive drum, said second light source means being adapted to invert a potential of a surface portion of said photoconductive drum which corresponds to said prospective first-color image formation portion to the first polarity, and to set remaining surface portions of said photoconductive drum at predetermined potentials of the second polarity;

a first developing unit disposed in front of said second light source means along the rotational direction of said photoconductive drum to develop the first color image;

(k+1)th (k=2, . . . , n) light source means disposed in front of a (k−1)th developing unit along the rotational direction of said photoconductive drum to perform a kth entire-surface exposure of said photoconductive drum, thereby setting a surface portion of said photoconductive drum which corresponds to a prospective kth-color image formation portion at a potential of the first polarity; and

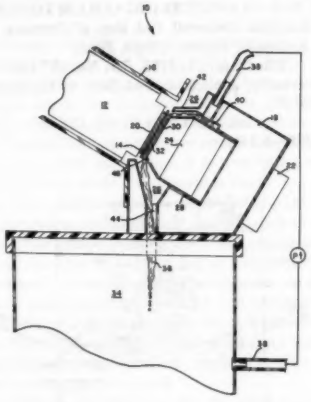
a kth developing unit disposed in front of said (k+1)th light source means along the rotational direction of said photoconductive drum to develop the kth color image.

4,515,463

INCLINED TONER FLOW CONTROL SYSTEM FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE UPON AN ELECTROPHOTOGRAPHIC FILM

John D. Plumadore, Westfield, Mass., assignor to Photon Chroma, Inc., Westfield, Mass.

Filed Jul. 30, 1982, Ser. No. 403,806
Int. Cl.³ G03G *15/10*
U.S. Cl. 355—10 **13 Claims**



1. Toner flow control apparatus for developing individual electrophotographic latent images upon an electrophotographic film, comprising:

a development electrode;

an electrophotographic film having an upper edge portion, a

lower free edge portion, and a predetermined longitudinal extent with said electrostatic latent images disposed thereon in a serial arrangement along said predetermined extent, and disposed adjacent to said development electrode such that said electrostatic latent images face said development electrode;

said electrophotographic film and said development electrode defining a channel therebetween; and

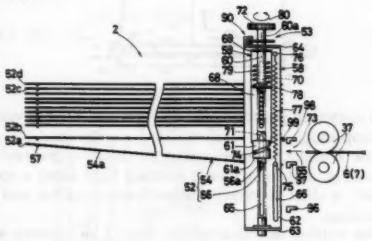
means for introducing toner into said channel in a direction transverse to said longitudinal extent of said electrophotographic film whereby said toner flows across said electrophotographic film from within the vicinity of said upper edge portion of said electrophotographic film to said lower free edge portion of said electrophotographic film for development of said individual electrostatic latent images,

said development electrode, said electrophotographic film, and said toner channel being disposed within parallel planes inclined with respect to a horizontal plane such that said toner flows through said channel and over the facing surfaces of said electrophotographic film and said development electrode in a controlled manner along said transverse direction across said electrophotographic film from within the vicinity of said upper edge portion of said electrophotographic film to said lower free edge portion of said electrophotographic film so as to be discharged from said channel and said lower free edge portion of said electrophotographic film within a vertical plane under the influence of gravity.

4,515,464
COPYING APPARATUS HAVING A COPY SHEET SORTER

Yutaka Shigemura; Hiroshi Kimura; Masahiko Hisajima; Isao Yada; Yoichiro Irie; Kiyoshi Morimoto; Yasuhiko Yoshikawa, and Takashi Nagashima, all of Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Sep. 28, 1982, Ser. No. 426,156
Claims priority, application Japan, Oct. 9, 1981, 56-162205
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **14 Claims**



1. In a copying apparatus equipped with a sorter which sorts a plurality of copy paper sheets, which correspond to an original document and which are discharged from a main body of the copying apparatus, into a plurality of bins which are successively shifted to a sheet discharge position by shifting means, the improvement wherein said sorter comprises:

copy number preset key means for setting the number of copies to be made by the copying apparatus;

memory means for memorizing said preset number of copies to be made;

first counter means for counting the number of copied paper sheets for each copying operation of the copying apparatus;

second counter means for counting the number of copy paper sheets discharged from the copying apparatus;

means for stopping the copying operation of the copying apparatus when the counted value of said first counter means equals said preset number of copies memorized by said memory means;

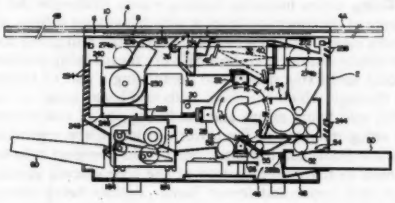
sort key means for selecting a mode of operation wherein the copy paper sheets are sorted into said bins one sheet into each bin; and

electrical circuit means for applying signals to said shifting means for changing the direction of shifting of said bins when the counted value of said second counter means equals the memorized preset number of copies in the sort mode.

4,515,465
ELECTROSTATIC COPYING APPARATUS

Hideo Miyoshi, Habikino; Tadashi Umeda, Yamato Takada, and Takashi Aoki, Kusatsu, all of Japan, assignors to Mita Industrial Company Limited, Japan

Division of Ser. No. 250,829, Apr. 3, 1981, abandoned. This application Feb. 8, 1983, Ser. No. 464,833
Claims priority, application Japan, Apr. 15, 1980, 55-49497
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **4 Claims**



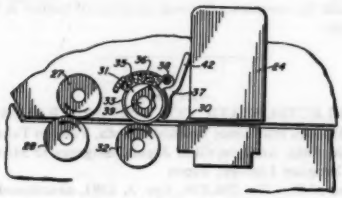
1. In an electrostatic apparatus comprising a housing, a photosensitive member disposed within the housing, a main electric motor driving connected to the photosensitive member for free movement of the photosensitive member through an endless moving path defined within the housing, an original-support mechanism disposed on the top surface of the housing and including a transparent plate on which to place an original document to be copied, a charging corona-discharge device for applying corona discharge to the photosensitive member in a latent electrostatic image-forming zone located along the moving path of the photosensitive member, an optical unit for projecting the image of the original document placed on the transparent plate onto the photosensitive member in the latent electrostatic image-forming zone, a copying paper transfer unit for transferring a copying paper through a predetermined transfer passage extending through a transfer zone located along the moving path of the photosensitive member and downstream of the latent electrostatic image-forming zone in the moving direction of the photosensitive member, a paper jamming detecting means for detecting the jamming of the copying paper in the transfer passage and thus producing a paper jamming signal, an emergency stopping means for stopping the copying process in response to the paper jamming signal, and a manually operable release switch for releasing the stopping action of the emergency stopping means; the improvement wherein the apparatus further comprises a preparatory driving means which, upon the releasing of the stopping action of the emergency stopping means by the operation of the release switch, energizes the main electric motor, thereby moving the photosensitive member through at least one rotation through said endless moving path, and (b) cleaning means responsive to releasing of the stopping action of the emergency stopping means by the operation of the release switch for cleaning said photosensitive member during the at least one rotation of said photosensitive member through said endless moving path.

4,515,466

SHEET DELIVERY STATION FOR COPYING APPARATUS

Carl B. Heisler, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1982, Ser. No. 382,514
Int. Cl.³ G03G *21/00, 15/20*
U.S. Cl. 355—15 **14 Claims**



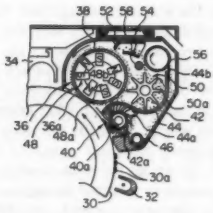
1. Reproducing apparatus comprising a frame having upper and lower portions, means for forming a dry toner image on a supporting sheet, means for fixing a toner image to said sheet, said fixing means including heating means to elevate the temperature of the toner to a level at which it at least softens, sheet delivery means for delivering said sheet from said fixing means to an output station, said sheet delivery means being positioned adjacent said fixing means and comprising a pair of transport rolls through which the sheet with said toner image is transported, said fixing means and the lower one of said transport rolls being mounted to the lower portion of the reproducing apparatus frame and the upper one of said transport rolls being mounted to the upper portion of the reproducing apparatus frame, said upper and lower frame portions being pivotally mounted relative to each other at one end, said upper roll in contact with the side of the sheet bearing the toner image having associated therewith a cleaning pad for cleaning the surface thereof of toner and debris, said cleaning pad being pivotally supported by a frame member about the axis of the upper roll, said cleaning pad comprising an inflammable pad of resiliently compressible flexible abrasive fibers forming a network of intercommunicating voids to scrape toner off the surface of said upper transport roll whereby said toner penetrates the voids of said cleaning pad.

4,515,467

MAGNET BRUSH CLEANING APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Kohji Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 12, 1983, Ser. No. 457,548
Claims priority, application Japan, Jan. 20, 1982, 57-6991
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **30 Claims**



1. A magnet brush cleaning apparatus for removing residual toner left non-transferred on a photoconductive element, comprising:

rotatable magnet brush means for cleaning the surface of the photoconductive element by forming a magnet brush by a cleaning agent and attracting the residual toner to support the residual toner on said magnet brush;

means for removing the cleaning agent and residual toner from the magnet brush and feeding the cleaning agent and residual toner into a circulatory cleaning agent supply path;

electric field producing means for producing an electric field in the circulatory cleaning agent supply path and separating the toner collected after the cleaning by the magnet brush means and the cleaning agent from each other; and

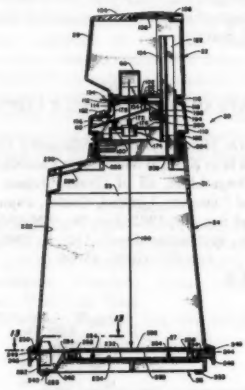
cleaning agent supply means for supplying the cleaning agent separated from the toner to the magnet brush means.

4,515,468

COMBINED PHOTOGRAPHIC ENLARGER AND PRINT DEVELOPING TRAY

Charles E. Taylor, Westlake Village; Anton Gattiker, Playa Del Rey, and Gary B. Krantz, Reseda, all of Calif., assignors to Phase One Products, Corp., Westlake Village, Calif.

Filed Mar. 25, 1983, Ser. No. 479,037
Int. Cl.³ G03B *27/32, 27/52;* G03D *17/00*
U.S. Cl. 355—27 **36 Claims**



1. A combined photographic enlarger and print developing tray comprising:

a slide housing, a light source mounted within said slide housing, said light source emitting light along a specific path, a slide receiving station formed within said slide housing;

a slide holder, said slide holder having an opening within which there is adapted to be located a photographic transparency, said slide holder to be located in a close fitting relationship with said slide receiving station, said opening to intersect said specific path, said slide holder and said opening being adjustable relative to said path and fixable in an established position;

a primary base;

a lens housing fixed to said slide housing, a lens mounted on said lens housing, said lens intersecting said specific path, said lens housing being connected by connecting means to said primary base, said connecting means permitting movement along said specific path of said slide housing in respect to said primary base;

a secondary base having an enlarged internal chamber, said secondary base having a top and a bottom which are interconnected by a side wall assembly, said primary base being connected by interlocking means to said secondary base at said top,

a view port formed within said primary base, said view port being spaced from said specific path;

a print tray assembly connected to said secondary base at said bottom, said print tray assembly having print receiving means, said print receiving means adapted to contain an unexposed photographic print which is to intersect said specific path, a panel normally covering said print receiving means to prevent premature exposure of the print, said panel having a focusing target, said focusing target accurately representing the size and position of the photographic print, said panel being movable between a first position covering said print receiving means to a second position permitting access to said print receiving means, said second position being spaced further from said lens than said first position, whereby a user can observe through said view port to magnify and focus the desirable image of the photographic transparency on said focusing target by moving of said slide housing relative to said base and then by physically moving of said slide holder select the desired position of the photographic transparency to achieve the desired photographic print and then removing said panel and then activating said light source to expose the photographic print; and

when using said view port said lens being unrestricted to pass the maximum amount of light therethrough producing a clear image on said focusing target with said panel in said first position, said lens being restricted during passing of light therethrough to expose the photographic print with said panel in said second position causing an automatic shift in focus producing a clear image on the photograph print.

4,515,469

MOTION PICTURE CAMERA HAVING AN INTERCHANGEABLE LENS

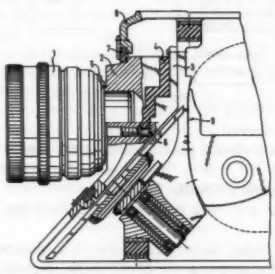
Otto Blaschek, Aschheim, Fed. Rep. of Germany, assignor to Arnold & Richter Cine Technik GmbH. & Co. Betriebs KG, Munich, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,689

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041161

Int. Cl.³ G03B *27/72, 27/76*

U.S. Cl. 355—35 **2 Claims**



1. A motion picture camera comprising:

a camera housing;

a camera mechanism including a film gate, said camera mechanism being suspended from said camera housing for preventing a transmission of structure-borne noise from said camera mechanism to said camera housing;

a lens adapter including a lens mount member and a flange, said flange being fixed to said camera mechanism;

an opening defined by said camera housing, said lens mount member being mounted in said opening and adapted to hold an interchangeable lens;

resilient mounting means for mounting said lens mount member in said opening;

a lens supporting plane defined by said lens mount member;

noise absorbing means interposed between said lens mount member and said flange for absorbing structure-borne noise generated by said camera mechanism; and

at least one adjustable stop mounted in said lens mount member and engaging said flange for maintaining a constant distance between said lens supporting plane and said film gate and for absorbing structure-borne noise generated by said camera mechanism.

4,515,470

APPARATUS FOR EXPOSING AND THEN SEPARATING SUPERPOSED ORIGINAL AND LIGHT-SENSITIVE SHEETS

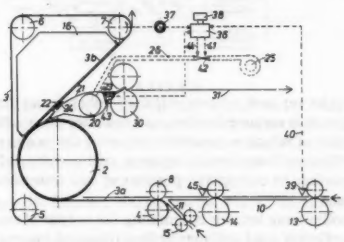
Albert T. Deckers, Maasbree, and Arie Leppink, Venlo, both of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Sep. 22, 1983, Ser. No. 534,742

Claims priority, application Netherlands, Oct. 18, 1982, 8204012

Int. Cl.³ G03B *17/24*

U.S. Cl. 355—105 **6 Claims**



1. In an apparatus for exposing to light and thereafter separating superposed original and light-sensitive sheets, including an exposure station, transport means for feeding an original sheet and a light-sensitive sheet, each in its own separate feed path, toward and then onto one another and then feeding said sheets one upon the other in a path through the exposure station, and means beyond the exposure station for leading one of said sheets away from the other sheet and thus separating the sheets automatically, the combination which comprises detector means for sensing and for delivering a signal upon the movement, past a certain location in its own feed path, of a said sheet that is to be led away by said separating means and means responsive to said signal to activate said separating means after a time delay equal to the period of time required for said transport means to feed up to said separating means the leading edge of a sheet sensed by said detector means.

4,515,471

SCANNING LASER RADAR

Dayton D. Eden, Dallas, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Aug. 25, 1981, Ser. No. 296,074

Int. Cl.³ G01C *3/08;* G01J *1/20, 1/00;* G02F *1/29*

U.S. Cl. 356—5 **3 Claims**

1. An optical radar comprising:

a scanning transmitter for generating a collimated first coherent signal having a variable angular position which comprises a scanning laser oscillator having:

an optically resonant cavity;

a variable reflectance surface at one end of said resonant cavity;

an output reflector at the other end of said resonant cavity, said output reflector reflecting a percentage of

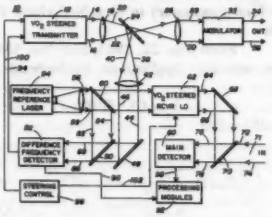
incident light and transmitting the remaining portion thereof;

a transmitter electron beam impinging the surface of said variable reflectance surface wherein the reflectivity of a selected portion of said variable reflectance surface increases thereby producing a transmitter pixel having a high reflectance that reflects light in a diffracted pattern;

an active laser medium between said variable reflectance surface and said output reflector;

a first focusing lens for collimating the diffracted pattern reflected from said transmitter pixel through said active medium;

a second focusing lens for condensing the collimated light that passes through and is output by said active medium, said second focusing lens condensing the collimated



light on said output reflector wherein an oscillating mode is sustained within said resonant cavity, the direction of which is varied by adjusting the position of said electron beam impinging upon said variable reflectance surface to change the position of said transmitter pixel; and

a collimating lens for collimating the output of said output reflector, said collimating lens disposed external to said resonant cavity; and a scanning receiver having:

a scanning local oscillator for generating a second coherent signal having a variable angular position;

mixing means for mixing the reflected portion of said first coherent signal that is returned as a return signal with second coherent signal; and

signal detection means for receiving the output of said mixing means and generating a signal in response to the presence of said return signal.

4,515,472

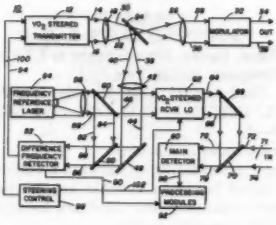
AGILE RECEIVER FOR A SCANNING LASER RADAR

Albert B. Welch, Dallas, Tex., assignor to LTV Aerospace and Defense Co., Dallas, Tex.

Filed Aug. 25, 1981, Ser. No. 296,075

Int. Cl.³ G01C *3/08*; G01J *1/20, 1/00*; G02F *1/29*

U.S. Cl. 356—5 **11 Claims**



1. A coherent optical receiver for receiving a coherent return signal comprising:

a variable reflectance surface;

means for generating a linearly polarized coherent signal;

directing means for directing said coherent signal to unformly illuminate said variable reflectance surface;

steering means for increasing the reflectance of said variable reflectance surface in a plurality of selected small areas to reflect said coherent signal that is incident on each of said selected small areas in a diffracted pattern having a conical shape, said steering means simultaneously increasing the reflectance in each of said selected small areas;

collimating means for receiving and collimating the reflected portion of said coherent signal reflected from each of said selected small areas to form a plurality of local oscillator beams at the output of said collimating means;

a summation means for summing said coherent return signal with the plurality of said local oscillator beams wherein said steering means selectively directs one of said local oscillator beams to overlap said return signal; and

detecting means for receiving the output of said summing means and providing a detected output signal in response to one of said local oscillator beams overlapping said return signal.

4,515,473

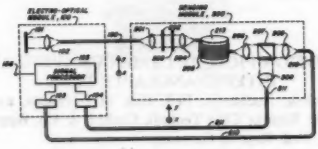
PHOTOELASTIC STRESS SENSOR SIGNAL PROCESSOR

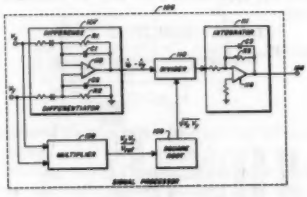
Marc D. Mermelstein, Chevy Chase, Md., assignor to Geo-Centers, Inc., Newton Upper Falls, Mass.

Filed Sep. 13, 1984, Ser. No. 650,229

Int. Cl.³ G01B *11/18*

U.S. Cl. 356—33 **2 Claims**





1. In a photoelastic polarimetric stress sensor of the type having

(a) a photoelastic element,

(b) means for directing polarized light into the photoelastic element,

(c) stress imposing means responsive to a phenomenon to be measured for stressing the photoelastic element,

(d) beam splitter means for splitting the polarized light passed through the photoelastic element into a plurality of beams each of which has a different polarized component of the light transmitted through the photoelastic element, and

(e) means responsive to the light intensities of the split beams for providing an output that is a measure of the stress on the photoelastic element,

the improvement wherein the means responsive to the light intensities of the split beams comprises

(i) a pair of photodetectors, each photodetector providing an electrical output signal in response to a different one of the split beams,

(ii) a difference differentiator responsive to the outputs of the

pair of photodetectors for providing an output proportional to the difference between derivatives of its inputs,

(iii) a multiplier responsive to the outputs of the pair of photodetectors for providing an output related to the product of its inputs,

(iv) a square rooter responsive to the output of the multiplier for providing an output that is the square root of its input,

(v) a divider responsive to the output of the difference differentiator as the numerator and the output of the square rooter as the divisor for providing an output signal, and

(vi) an integrator responsive to the output of the divider for providing an output signal that is a measure of the imposed stress.

4,515,474

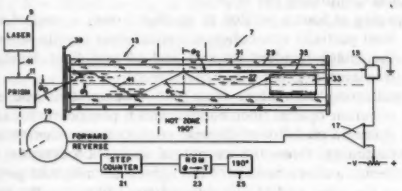
METHOD AND APPARATUS FOR DETERMINING PEAK TEMPERATURE ALONG AN OPTICAL FIBER

Richard J. Fox, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 29, 1982, Ser. No. 403,278

Int. Cl.³ G01J *5/08, 5/28*

U.S. Cl. 356—44 **10 Claims**



1. Temperature-sensing apparatus, comprising:

an optical fiber capable of supporting multimodal propagation of light and including (a) a core whose refractive index decreases with increasing temperature, (b) a cladding therefor having a lower refractive index than said core, and (c) a jacket for said cladding having a lower refractive index than said cladding,

a light source mounted to launch into said core a light beam defining with the core axis a launch angle of progressively changing magnitude, said light beam being selected to establish substantially single-mode light propagation in said core,

light-responsive means associated with said cladding for generating a first output indicative of onset of light refraction therein from said core,

means responsive to the first output for generating a second output indicative of the value of the launch angle coincident with said onset, and

means responsive to the second output for generating an output indicative of the fiber temperature corresponding to said value.

4,515,475

MEASUREMENT OF REFRACTIVE INDEX PROFILE

David N. Payne; Issei Sasaki, and Michael J. Adams, all of Southampton, England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB81/00040, § 371 Date Oct. 1, 1981, § 102(e) Date Oct. 1, 1981, PCT Pub. No. WO81/02634, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 11, 1981, Ser. No. 308,542

Claims priority, application United Kingdom, Mar. 11, 1980, 8008158

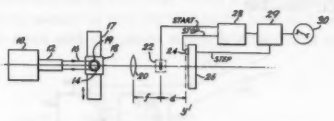
Int. Cl.³ G01N *21/47*

U.S. Cl. 356—73.1 **15 Claims**

1. A method of sensing the optical deflection function of an approximately cylindrical object comprises:

illuminating the object over its width to be tested with a collimated beam of light;

sensing the light transmitted by the object so that in the focal plane the distance of transmitted light from the optical axis in a direction perpendicular to the cylindrical axis of the object is linearly proportional to the angle through which light has been deviated by the object;



passing the focused light through a modulator to cause a parameter of the light by means of a modulator to vary as a function of said distance; and

receiving the modulated light in an image plane, and measuring said parameter at a plurality of positions in said image plane, whereby the deflection function of the object can be derived.

4,515,476

DEVICE FOR THE OCULAR DETERMINATION OF ANY DISCREPANCY IN THE LUMINESCENCE CAPACITY OF THE SURFACE OF A TOOTH FOR THE PURPOSE OF IDENTIFYING ANY CARIED AREA ON THE SURFACE TO THE TOOTH

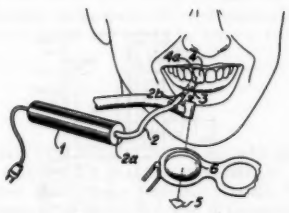
Bjelkhagen H. Ingmar, Hagagatan 54, 113 47 Stockholm, Sweden

Filed Mar. 31, 1982, Ser. No. 363,788

Claims priority, application Sweden, Apr. 1, 1981, 8102103

Int. Cl.³ G01N *21/64;* **A61B** *6/00*

U.S. Cl. 356—318 **10 Claims**



1. A device for the ocular determination of any discrepancy in the luminescence capacity of the surface of a tooth for assessing the extent of a caried or another defective area of the surface of the tooth, comprising a light generating device for generating light limited at least within a predetermined wavelength range for illuminating the surface of the tooth, and for causing luminescence of the surface of the tooth, the wavelength range of the light being visible to the human eye, an absorption filter for eliminating reflections and luminescence within the wavelength range of the light generating device such that ocular determination of any discrepancy in the luminescence capacity of the tooth surface occurs outside the wavelength range wherein the absorption filter eliminates light only within the wavelength range emitted by the device, whereby every area with a luminescence capacity differing from the luminescence capacity of the surface of a sound tooth will be perceived as a dark area.

4,515,477

VISIBILITY METER AND COMPONENTS USED THEREIN

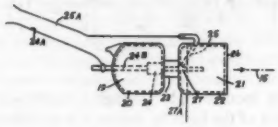
Frank Früngel, Im Glockenacker 2, 8053 Zürich, Switzerland

Continuation of Ser. No. 196,145, Oct. 10, 1980, abandoned. This application Jul. 5, 1983, Ser. No. 510,743

Claims priority, application Switzerland, Feb. 10, 1979, 8850/79

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—338 **1 Claim**



1. A visibility meter using a forward scatter of light pulses in an atmospheric sample, comprising a pulse light transmitter for transmitting a downwards directed beam of light pulses and having a light source in the form of a point-shaped, end-on capillary spark; a light receiver arranged opposite said transmitter; and a V-shaped heated diaphragm being arranged between said transmitter and receiver to interrupt optical contact therebetween.

4,515,478

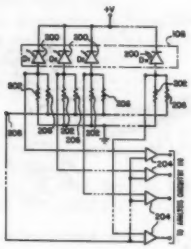
COHERENT LIGHT DETECTING SYSTEM INCLUDING PASSIVE AVERAGING NETWORK

Paul T. Ballard, and Gordon R. Little, both of Kettering, Ohio, assignors to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Nov. 5, 1982, Ser. No. 439,475

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—345 **11 Claims**



1. Apparatus for detecting temporally coherent light comprising:

an interferometer for receiving light to be analyzed;

an array of photosensitive elements upon which interference patterns generated by said interferometer in response to temporally coherent light incident thereon are directed, said photosensitive elements being connected to generate signals representative of optical energy respectively incident thereon;

signal averaging means comprising a passive resistor network coupled to said elements for deriving an average signal from the signals generated by said elements; and

comparator means for comparing each of the signals generated by said elements to said average signal.

4,515,479

ELECTRO-OPTICAL SENSORS WITH FIBER OPTIC BUNDLES

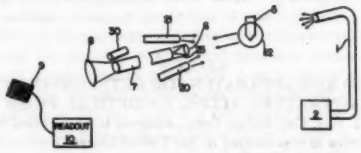
Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Ontario, Canada

Division of Ser. No. 173,370, Jul. 29, 1980,. This application Mar. 22, 1983, Ser. No. 477,775

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.³ G01B *11/14*

U.S. Cl. 356—375 **71 Claims**



1. A method of determining the dimension, location, orientation, presence, or identity of at least a portion of an object, said method comprising the steps of:

imaging at least a portion of an object onto an end of an at least partially non-coherent optical fiber bundle whereby the image incident on said end of said fiber bundle is transmitted to the other end thereof;

transferring said image from said other end of said non-coherent optical fiber bundle onto a photodetector comprising a plurality of discrete photodetector elements;

determining, from the output of said photodetector elements, a characteristic of the lighted or unlighted portion at the other end of said non-coherent fiber bundle; and

determining, from said characteristic, said dimension, location, orientation, presencc, or identity of at least said portion of said object.

4,515,480

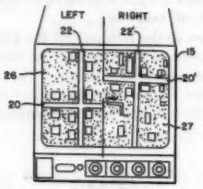
PATTERN ALIGNMENT SYSTEM AND METHOD

William I. Miller, Campbell, and Robert D. Reimiller, Sunnyvale, both of Calif., assignors to Micro Automation, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 151,418, May 19, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,368

Int. Cl.³ G01B *11/00*

U.S. Cl. 356—400 **8 Claims**



1. An object alignment system comprising

means for optically scanning an object to generate first data signals representing the reflected light level of said scanned object,

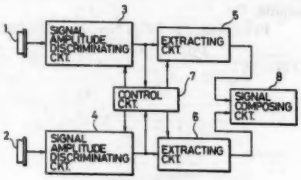
integrator means connected to receive said first data signals for averaging said first data signals to form second data signals representing electronically smeared data signals for each scan line of said scanned object, and

means for determining the best match between said averaged data signals and predetermined stored data signals without regard or dependence upon the sharpness of said averaged data signals.

4,515,481
APPARATUS FOR PROCESSING A SIGNAL FOR ALIGNING

Yasuyoshi Yamada, Kawasaki, and Ryozo Hiraga, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,511
Claims priority, application Japan, Sep. 24, 1981, 56-151530
Int. Cl.³ G01B *11/00*
U.S. Cl. 356—400 **9 Claims**



1. A signal processing apparatus operable in cooperation with a first object having at least one standard mark thereon and a second object having at least one reference mark thereon, said apparatus comprising:

first sensing means for sensing said standard mark and generating a first signal stream containing a desirable signal concerning said standard mark and an undesirable signal concerning said reference mark;

second sensing means for sensing said reference mark and generating a second signal stream containing a desirable signal concerning said reference mark and an undesirable signal concerning said standard mark;

extracting means for forming a timing signal from at least one of said first and said second signal streams, for extracting the desirable signal concerning said standard mark from said first signal stream by means of said timing signal, and for extracting the desirable signal concerning said reference mark from said second signal stream by means of said timing signal; and

signal composing means for composing the extracted desirable signal concerning said standard mark and the extracted desirable signal concerning said reference mark.

4,515,482
STERILE SUSPENSION AND SOLUTION HOLDING AND MIXING TANK

Frederic H. Schadewald, Ross Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 522,434, Aug. 11, 1983, abandoned.
This application Feb. 28, 1984, Ser. No. 583,781
Int. Cl.³ B01F *15/00*
U.S. Cl. 366—136 **19 Claims**

1. A mixing apparatus for preparing suspensions, emulsions and solutions, comprising:

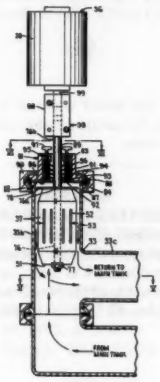
container means adapted for holding a mixture of materials to be formed into a suspension, emulsion or solution;

inlet means for feeding said materials into said container means;

outlet means for withdrawing a product from said container means;

an external recirculation loop having a first end communicating with said container means near to the bottom of said container means, and having a second end communicating with said container means near to the bottom of said container means but above said first end, said external recirculation loop comprising a continuous, elongated conduit which extends from said first end to said second end and forms a flow path between said first and second ends so that successive portions of the mixture of materials in said container means can be continuously flowed in series through said external recirculation loop, said external recirculation loop having a branch portion which adjoins and communicates with said continuous, elongated conduit at one end of said branch portion; and

mixing means including a rotatable, hollow mixer head substantially completely disposed in said branch portion, said mixer head having wall means defining an internal cavity having a centrally located inlet opening at one end thereof and a plurality of circumferentially spaced-apart radial slots extending from said cavity and defining outlets therefrom, means for rotating said mixer head to draw said mixture from said container means into said first end of



said external recirculation loop, then into said internal cavity of said mixer head through said inlet opening, the impel said mixture radially outwardly from said internal cavity through said slots, whereby said mixture is intensely mixed and subjected to high fluid shear effective to homogenize said mixture, said mixture then flowing through said external recirculation loop to said second end thereof, then out of said second end into the interior of said container means, whereby said mixture is continuously recirculated and mixed to form a homogeneous product.

4,515,483
APPARATUS FOR REMOVING SUBSTANCES FROM THE INNER WALLS OF VESSELS

Rudolf Müller; Hans-Jürgen Radeklau; Harald Döfke, and Detlef Krieger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

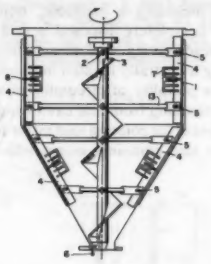
Filed Aug. 16, 1983, Ser. No. 523,557
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1982, 3230763
Int. Cl.³ B01F *7/24*
U.S. Cl. 366—303 **9 Claims**

1. An apparatus for removing substances from the inner walls of a vessel, comprising:

vertically extending agitating shaft means arranged in a vessel, and having agitator arms for agitating materials in said vessel;

displaceable scraper means displaceably attached to said agitator shaft means at said agitator arms, and adapted for being positioned in sufficient proximity to the walls of said vessel effective to scrape off material accumulated on the walls upon operation of said vertically extending agitating shaft means, and said scraper means comprising plural

parts, which are interconnected by a comb, in a manner providing a spacing between the scraper means parts; and



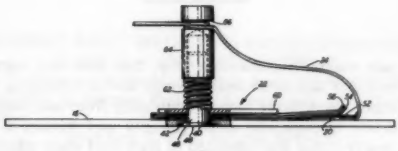
webs attached to the vessel walls so as to extend into said spacing between the scraper means parts when the scraper is put into operation.

4,515,484

TEMPERATURE TESTING APPARATUS FOR AN ELECTRONIC CIRCUIT SUBSTRATE

James H. Gilley, Swepsonville, N.C., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 15, 1983, Ser. No. 561,697
Int. Cl.³ G01K *11/00*
U.S. Cl. 374—137 **7 Claims**



1. An apparatus for testing the reflow-soldering temperature profile on an electronic circuit substrate having a heated surface exposed to a source of heat and a test surface where the reflow soldering is to take place and which has the temperature profile to be tested, comprising:

an aperture extending through the substrate between the two surfaces, with a recess surrounding the aperture and adjacent to the heated surface;

a bolt having a head, the bolt extending through the aperture in the substrate and beyond, with the head of the bolt located in the recess;

screw threads on a portion of the bolt extending beyond the test surface of the substrate;

a flat spring having an aperture therethrough, the flat spring oriented to bear against the test surface of the substrate, with the bolt extending through the aperture in the flat spring;

a pressure plate having an aperture therethrough, the pressure plate oriented to press the flat spring against the test surface of the substrate, with the bolt extending through the aperture of the pressure plate;

a coil spring positioned around the bolt and oriented to press the pressure plate toward the test surface of the substrate;

a nut having internal threads engaging the threads of the bolt, the threaded engagement being sufficient for the nut to deflect the coil spring by an arbitrary amount;

a wire-guiding groove extending around the nut;

a thermocouple having at least one electrical wire extending therefrom, the thermocouple located between the substrate and the flat spring, the flat spring being deflected sufficient to accommodate and exert a force upon the thermocouple to hold the thermocouple in place, the thermocouple wire being wrapped about the wire-guiding groove; and

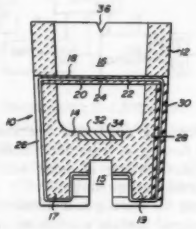
a flexible thermal and electrical insulator located between the flat spring and the thermocouple.

4,515,485

MOLTEN METAL SAMPLE CUP

John E. Cassidy, Churchville, and L. Raymond Jones, Jr., Huntingdon Valley, both of Pa., assignors to Electro-Nite Co., Philadelphia, Pa.

Filed Jan. 21, 1983, Ser. No. 459,904
Int. Cl.³ G01K *1/08*
U.S. Cl. 374—157 **15 Claims**



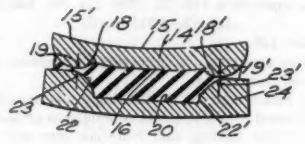
1. A molten metal sample cup for use in determining phase change of molten metal comprising a refractory cup having a cavity for receiving molten metal, temperature sensing means in said cavity and supported by said cup, a blob which includes a material which promotes the formation of carbides, said blob being disposed within said cavity, and means within said cavity for limiting the surface area of said blob exposed to said cavity to a predetermined uniform amount which is less than one half the total surface of the blob.

4,515,486

ELASTOMERIC SUPPORTED HYDRODYNAMIC BEARING

Russell D. Ide, 28 Daniel Dr., Coventry, R.I. 02816

Filed Feb. 3, 1984, Ser. No. 576,570
Int. Cl.³ F16C *32/06*
U.S. Cl. 384—117 **6 Claims**

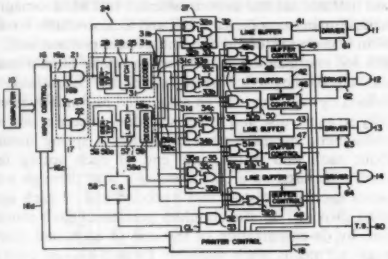


1. A fluid bearing for supporting an opposing moving part, a plurality of bearing pads, each pad having a face member and a support member separated by and bonded to an elastomeric material, said face member having a load engaging surface and a back surface with at least one arcuate point of inflection, which at rest opposed an arcuate point of inflection located on said support member, and which under fluid lubricant friction and pressure forces, move to form a wedge for hydrodynamic lubrication; said friction causing lateral pad motion and misalignment of the opposing points of inflection, said pressure force causing tilting of the pad to develop a lubricant wedge.

4,515,487
MULTICOLOR PRINTER

Hitoshi Minami, Soka, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,647
Claims priority, application Japan, Mar. 29, 1982, 57-50676; Mar. 29, 1982, 57-50677
Int. Cl.³ B41J 3/12, 35/16
U.S. Cl. 400—121 4 Claims



1. A multicolor printer for moving together and driving at predetermined timing a plurality of dot system printing heads provided for each color of three primary colors, yellow, magenta and cyan, to effect multicolor printing, comprising:

a plurality of line buffers for storing dot patterns for one line portion to be printed by color in correspondence to each of the printing heads;

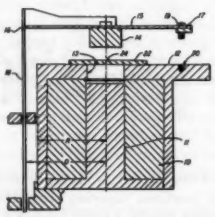
a plurality of head driving circuits for individually driving the printing heads in accordance with output data of said line buffers; and

data selector means for selectively putting out dot pattern data with color information of three primary colors to a predetermined line buffer designated by said color information, said data selector means comprising a discrimination circuit for detecting said color information from said dot pattern data and printing data, and a decoder circuit for actuating said line buffer as required by said color information from said discrimination circuit to render said remaining line buffers inoperable.

4,515,488
ASSEMBLING DOT MATRIX PRINT HEADS

Royden C. Sanders, Jr., Burton Hwy., Wilton, N.H. 03086, and John L. Forsyth, Newton Junction, N.H., assignors to Royden C. Sanders, Jr., Wilton, N.H.

Filed Jul. 2, 1984, Ser. No. 626,668
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 13 Claims



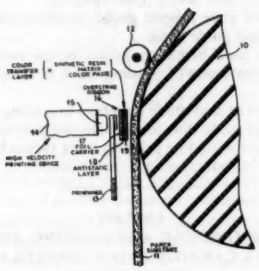
1. The method of assembling a dot matrix print pin driving spring in relation to a solenoid having an axial hole, said spring carrying an armature and said hole being designed for receiving said armature, said solenoid being carried by a housing, positioning a plastic sheet adjacent the hole, with an edge of the plastic sheet overlying the hole, inserting the armature into the hole thereby partially drawing the plastic sheet into the hole so that it engages more than 180° of surface of the armature as measured around the axis of the hole to center the armature in the hole.

10. A partially assembled dot matrix print head comprising a dot matrix print pin driving spring in relation to a solenoid having an axial hole, said spring carrying a cylindrical armature and said hole being designed for receiving said cylindrical armature, said solenoid being carried by a housing, a plastic sheet removably inserted in the hole to center the cylinder so that the sheet engages portions of the interior of the hole spaced about more than 180° of circumference, means for rigidly securing said armature spring to a portion of a housing bearing a predetermined relation to the hole.

4,515,489
OVERSTRIKE RIBBON FOR PRINT WHEELS

Ulrich Kohle, Burgdorf, and Hans Paffhausen, Hanover, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,871
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125782; Apr. 19, 1982, 3214305
Int. Cl.³ B41J 31/02
U.S. Cl. 400—241.2 5 Claims



1. An overstrike ribbon capable of being advance with each printing of a letter between a high velocity printing device and a substrate through a fraction of the character width, said ribbon comprising:

a synthetic-resin foil carrier; and

a color-transfer layer on said carrier and bonded thereto, said color transfer layer comprising:

a synthetic-resin matrix; and

a color paste dispersed in said matrix, said color paste comprising:

an oil vehicle consisting of a mineral oil containing 25–50% by weight of aromatic-hydrocarbons and 30–40% of the saturated bonded carbon atoms being cycloaliphatically bonded;

a coloring pigment distributed in said vehicle;

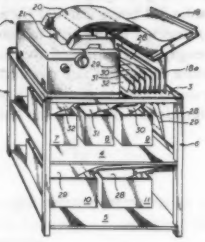
a cationic wetting agent in the form of at least one fatty amine sale of a fatty propylene diamine of the formula $R—NH—(CH_2)_3—NH_2$, where R is a long-chain fatty acid residue; and

a finely divided solid filler with a high specific surface area and a particle size distribution of 0.2 to 20 microns.

4,515,490
COMPUTER PRINTER STAND WITH MULTIPLE PAPER WEB GUIDE SLOTS

Franklin Marker, III, 28 Cooper, Houston, Tex. 77076

Filed Jan. 27, 1984, Ser. No. 574,414
Int. Cl.³ B41J *15/04*
U.S. Cl. 400—613.2 **11 Claims**



1. A stand for supporting a printer and containers for different sizes and types of continuous printing stock for feeding the printing stock to the printer comprising:

a plurality of vertically extending legs,

a plurality of horizontally positioned shelves supported on said legs in vertically spaced relation,

the top shelf having one end portion for supporting a printer,

a support member supported on and extending upward from the other end of said top shelf,

a tray supported on said support member for receiving and storing printed output from said printer,

a plurality of guide slots in said top shelf between said one end portion and said support member,

a plurality of plate shaped guide members centered one in each of said guide slots,

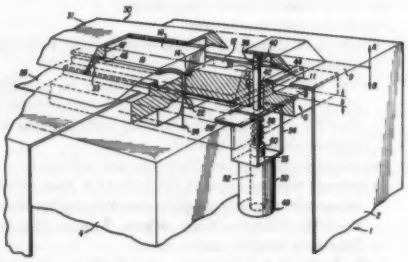
at least one shelf being positioned below said top shelf to support containers of printing stock in selected positions, and

at least some of said guide members extending downwardly below said guide slots to said selected positions above said containers for guiding printing stock through said slots for selective introduction into the printer.

4,515,491
DEVICE FOR OPENING AND CLOSING AN EXIT SLIT FOR A DATA CARRIER AND A PRINTER UTILIZING SUCH DEVICE

Roger Chevrel; Michel Attard, and Michel Leviandier, all of Paris, France, assignors to Compagnie d'Informatique Militaire Spatiale & Aeronautique-CIMSA-25, Paris, France

Filed Jul. 6, 1983, Ser. No. 511,239
Claims priority, application France, Jul. 6, 1982, 82 11842
Int. Cl.³ B41J *29/12*
U.S. Cl. 400—693 **10 Claims**



1. A device for opening and closing an exit slit for a data carrier, said slit being formed in a part providing passage of said carrier through said slit, comprising:

a mobile door disposed at a level of said slit so as to cover the latter;

means for raising and lowering said door, including first and second mobile pistons aligned along a longitudinal axis of said slit, said pistons being disposed on each side of said slit and fixedly mounted at one end thereof to said door, each of said pistons having a shoulder portion;

electromagnetic means for controlling operation of each of said first and second pistons wherein said electromagnetic means further comprises a coil and a core which are fixed to an end opposite said one end of said pistons; and

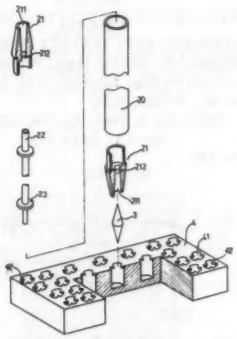
means for energization and de-energization of said coil of said electromagnetic means such that each assembly formed by said core and an associated piston moves vertically so as to raise and lower said door wherein said electromagnetic means further comprises a spring mounted about each said piston, one end of each spring being fixedly disposed on a part forming a base through which passes each said piston, and a second end of each spring being disposed on said shoulder portion of each piston so that, by de-energization of the coil of each said electromagnetic means, each assembly formed by said core and the associated piston moves downwardly while causing relaxation of each said spring so that said door obtains a lowered position in which said exit slit is closed;

further comprising first and second support parts each having a U shape in cross-section and each having a horizontal arm which includes a central opening through which slides said assembly formed by said core and the associated piston and having two vertical arms which are interlocked with said base, the coil of each of said electromagnet means being fixedly mounted to the horizontal arm of each U-shaped support part.

4,515,492
WRITING IMPLEMENT AND KIT

Chen J. Shan, No. 2, Chung-Nei Rd., Cho-Yun Village, Yuanchang, Hsiang, Yun-Lin Hsien, Taiwan

Filed Jun. 1, 1983, Ser. No. 499,940
Int. Cl.³ B43K *31/00, 29/20*
U.S. Cl. 401—52 **4 Claims**



1. A writing kit comprising, a plurality of leads each having a pair of tapered portions tapering from the central portion toward two opposite points, a stand having a plurality of holes therein for selectively receiving said leads, a writing implement including an elongated barrel having an opening therethrough and opposite ends, a pair of collet means engaging said ends of said elongated barrel so as to be oppositely oriented with respect to one another, each of said collet means having a conical internal surface for engaging and gripping said tapered portions of said leads and having an opening therein

which is generally aligned with said opening through said elongated barrel, a push rod means disposed within said elongated barrel and being movable through said opening in said collet means, said push rod means having means for limiting the movement of said push rod means within said elongated barrel, and with respect to each of said opposite ends thereof, said push rod means being operable to urge a lead from engagement with either of said collet means.

4,515,493

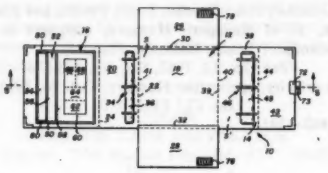
PORTABLE DESK AND BRIEFCASE

Albert F. Radovich, 54 Southlite Cir., Sacramento, Calif. 95831

Continuation-in-part of Ser. No. 282,392, Jul. 13, 1981, abandoned. This application Nov. 28, 1983, Ser. No. 555,900

Int. Cl.³ B42F *13/12;* **D45F** *3/00;* **D47B** *3/10*

U.S. Cl. 402—4 **3 Claims**



1. A portable desk and briefcase apparatus comprising:

a stiff rectangular back member having an inside surface defining a first plane;

stiff rectangular left and right side members having outside surfaces, said members being hingedly attached to said inside surface of said back member in spaced relation to first and second side edges thereof and respectively foldable from open positions with said outside surfaces lying substantially in said first plane to closed positions lying in second and third planes perpendicular to said first plane and lying inwardly of said first and second side edges, said left and right side members being respectively provided with first and second fastening means;

a stiff rectangular bottom member having a first edge hingedly attached to a third edge of said back member and foldable from an open position with an inside surface thereof lying in said first plane to a closed position lying in a fourth plane perpendicular to said first, second and third planes and with side edges thereof disposed outside of said second and third planes;

a stiff rectangular front member having a first edge hingedly attached to a second edge of said bottom member and foldable from an open position with an inside surface thereof lying in said first plane to a closed position lying in a fifth plane parallel to said first plane and with side edges thereof disposed outside of said second and third planes, said front member being provided with third and fourth fastening means respectively disposed proximate second and third edges of said front member, said front member being also provided with a first latching means;

pocket means affixed to the surface of said front member facing said inside surface of said back member when said members are in said closed position, the sides of said pocket means being disposed inwardly of said second and third edges of said front member and forming stops for limiting inwardly folding movement of said side members and providing means for carrying said third and fourth fastening means;

a stiff rectangular top member having a first edge hingedly attached to a fourth edge of said back member and foldable from an open position with an inside surface thereof lying in said first plane to a closed position lying in a sixth plane perpendicular to said first, second and third planes and with side edges thereof disposed outside of said second and third planes;

a rectangular flap member having a first edge hingedly attached to a second edge of said top member, said flap member having second latching means;

binder means affixed to at least one of said top and bottom members for holding work papers; and

handle means attached to said top member, whereby when all of said members are in said open position, access is provided to papers affixed to said binder means, and when said members are in said closed positions, said back member, said bottom member, said front member and said top member are held in such positions by the engagement of the inside surfaces thereof with the four edges of said side members and by the engagement of said first and third fastening means, the engagement of said second and fourth fastening means and the engagement of said first and second latching means, and the closed aparatus may be carried by said handle means.

4,515,494

FRAMEWORK CONNECTION MEANS

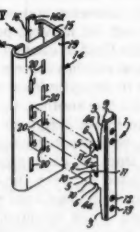
Leonard T. Robilliard, 13, Brickfield Ave., Leverstock Green, and Alan R. Hewitt, 26, Crossways, Leverstock Green, both of Hemel Hempstead, Hertfordshire, England

Filed Apr. 19, 1982, Ser. No. 369,876

Claims priority, application United Kingdom, Apr. 22, 1981, 8112487

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—187 **3 Claims**



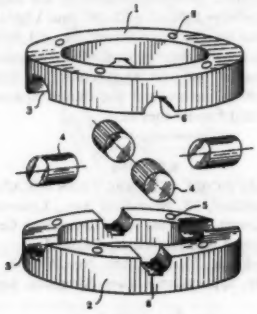
1. Connection means for the attachment, to a framework upright member, of another framework member by means of a clip device, said connection means comprising a bracket consisting of a vertically elongated angle section separate from the upright member and provided with vertically oriented hook formations by which it can be detachably engaged by relative vertical movement with openings in the said upright member, said bracket having vertical slots which are selectively engageable by parts of the clip device, the said hook formations being provided on a first wall part of said bracket and the said slots being provided in a second wall part of said bracket, said first and second wall parts of said bracket being oriented at right angles to each other and being so disposed as to be mutually unobstructive, the said hook formations extending from said first wall part of said bracket at right angles to said first wall part in a plane parallel to the plane of said second wall part of the bracket, said hook formations extending from said first wall part in spaced relation to said second wall part at positions that are not located opposite to the slots in the second wall part of said bracket, and the said second wall part of said bracket having a distancing abutment in the form of a return flange on the edge of said second wall part remote from said first wall part, said return flange extending from said edge of said second wall part toward said first wall part in a plane that is parallel to and spaced from said second wall part, the spacing between said return flange and said second wall part being sufficient to receive said parts of the clip device and being less than the spacing between said hook formations and said second wall part.

4,515,495

LINKING ARRANGEMENT FOR A SHAFT AND A FLY-WHEEL

Jean Trouillet, Fontaine-Valmont, Belgium, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed Sep. 27, 1982, Ser. No. 424,519
Claims priority, application France, Sep. 25, 1981, 81 18074
Int. Cl.³ F16B *00/00*
U.S. Cl. 403—336 **4 Claims**



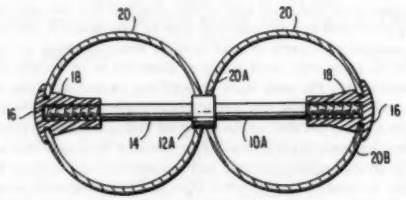
1. A linking arrangement for a shaft and a moving part rotatable about the same axis, comprising two rigid coaxial rims having the same diameter and which are respectively fastened to the shaft and the moving part with opposed surfaces of the coaxial rims fixed in contact with one another and having radial cylindrical notches therein containing respective cylindrical pins which fit the cylindrical notches when the rims are fixed in contact with one another, there being stress-relieving grooves along the entire length of the notches so as to define, for each notch, two essentially equal cylindrical surface portions at opposite sides of each groove, whereby rotary motion can be transmitted between the shaft and the moving part without producing significant axial stress therebetween as a result of torsion and while maintaining constant contact between the opposed surfaces of the rims regardless of differential expansion which may affect either rim.

4,515,496

SECURING ASSEMBLY

Stewart K. McKay, National Park Rd., Canungra, Queensland, Australia 4275

Filed Mar. 15, 1983, Ser. No. 475,652
Int. Cl.³ B25G *3/36*
U.S. Cl. 403—388 **5 Claims**



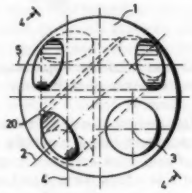
1. A securing assembly for securing together a pair of adjacent round tubular frame members having two pairs of coaligned apertures defining two outer apertures and two inner adjoining apertures comprising an elongated fastener element for interconnecting said tubular frame members having a plurality of retaining projections at each end thereof and an intermediate raised portion adapted to engage the two inner adjoining apertures in said tubular frame members, said intermediate raised portion having external dimensions substantially identical to the internal dimensions of said inner adjoining apertures and a pair of cap members each having an arcuate head portion and a shank adapted to be located in each of said 2 outer apertures, each shank having an internal blind bore in which the respective end of said elongated fastener element is secured by means of said retaining projections whereby said arcuate head portion of each cap member is adapted to abut a curved adjacent surface of a respective tubular frame member and said intermediate raised portion inhibits any shearing action by the elongated fastener element and maintains said securing assembly in a state of compression.

4,515,497

CLAMPING ELEMENT FOR THE RELEASABLE FASTENING OF SPATIALLY ARRANGED, OR PARALLEL BARS, TUBES AND SIMILAR OBJECTS

László Gillemot; János Prodán; Endre Pataki, and Ernö Zuckermann, all of Budapest, Hungary, assignors to Magyar Aluminiumipari Tröszt, Budapest, Hungary

Filed Oct. 12, 1982, Ser. No. 433,574
Claims priority, application Hungary, Oct. 26, 1981, 3139
Int. Cl.³ F16B *7/04*
U.S. Cl. 403—391 **9 Claims**



1. A clamping element for the releasable interconnection of spatially arranged bars or tubes comprising:

a basic body including at least one fixing hole for receiving a clamping insert, and at least two inlet holes for receiving bars or tubes, said inlet holes being arranged in parallel or by-pass relationship with respect to each other and disposed to penetrate said fixing hole, and

(b) a clamping insert arranged in said fixing hole, said clamping insert being tightenable in its axial direction; the surface of said clamping insert being provided with curved recesses cut into said surface, said recesses being shaped to cradle and to contact along its whole surface said bars or tubes that are arranged in said inlet holes, said clamping insert having a profile with parallel generatrix.

4,515,498

SLOTTED DRAINAGE GRATE WITH SUPPORT

Roland Thomann, and Markus Amann, both of Langnau, Switzerland, assignors to Polydrain, Inc., Troutman, N.C.

Filed Jun. 20, 1983, Ser. No. 506,244
Claims priority, application Switzerland, Nov. 23, 1982, 6827/82
Int. Cl.³ E01F *5/00*
U.S. Cl. 404—4 **8 Claims**

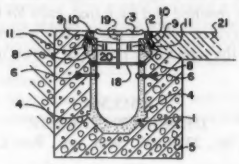
1. A support for a grate of the type comprised of a strip of sheet metal having transverse water drainage slots therein, the edges of said sheet metal being bent twice along its longitudinally extending edges to form two U-shaped side channels whose open sides are mutually opposed, said support comprising:

(a) a U-shaped arch open on each end and adapted to be positioned transversely across said grate in contact with opposite sides thereof and intermediate at least some of the slots to provide support to the width of the grate;

(b) each end of said arch defining a shoulder having a width

and depth sufficient to be positioned in said opposing side channels and provide support to the side of said grate; and

(c) said support including a mid-section intermediate its ends, wherein the shoulder depth of the mid-section of the



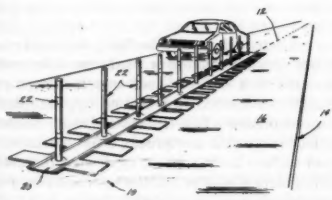
support is greater than at the end sections so that the mid-section extends downwardly from said two U-shaped side channels and bears against and supports the innermost shoulder of the mutually opposed, inwardly facing side channels.

4,515,499

TRAFFIC LANE DELINEATOR

David L. Furiate, 7805 Marion Twp., Rd. #237, Findlay, Ohio 45840

Filed Apr. 19, 1983, Ser. No. 486,359
Int. Cl.³ E01F *15/00*
U.S. Cl. 404—6 **13 Claims**



7. A traffic lane delineator for placement on the surface of a vehicle pathway comprising, in combination,

an elongate, flexible planar assembly for disposition on such surface, said assembly including a base portion having substantially planar upper and lower surfaces and a plurality of spaced-apart tabs extending from at least one edge of said base portion for providing an audible warning to vehicles moving thereover, said tabs having an upper surface coplanar with said upper surface of said base portion,

means for securing said tabs on the surface of such vehicle pathway, and

a plurality of spaced-apart vertically oriented dividers disposed generally medially along said base portion, said dividers including a cylindrical member, a mounting base associated with each said cylindrical member and means for selectively securing such dividers to said base portion.

4,515,500

COMBUSTION POWERED WAVE GENERATOR

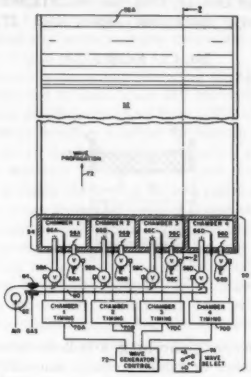
Dirk Bastenhof, Langerak, Netherlands, assignor to Ecopool Design Limited, Channel Islands, Channel Islands

Filed Nov. 15, 1983, Ser. No. 551,951
Int. Cl.³ E04H *3/16;* **F04D** *35/00*
U.S. Cl. 405—79 **14 Claims**

1. A wave generator system for generating waves in a swimming pool comprising:

at least one chamber communicative with said swimming pool through a below-the-water passage and having a sealed portion extending above the water level of said pool, each chamber comprising:

means for selectively introducing combustive elements into said chamber; and



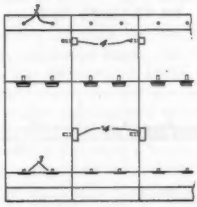
means for selectively igniting said combustive elements within said chamber according to the waves to be generated.

4,515,501

TUNNEL LININGS

Norman S. Thomas, Drayton, England, assignor to Fairclough Civil Engineering Limited, London, England

Filed Aug. 16, 1982, Ser. No. 408,574
Claims priority, application United Kingdom, Dec. 15, 1981, 8137819
Int. Cl.³ E21D *11/08*
U.S. Cl. 405—153 **12 Claims**



1. A method of joining together arcuate concrete segments of a tunnel lining which comprises providing an edge of one segment with a recess accessible from the inside of the tunnel and a pair of abutment members projecting into the recess to define a constriction therein with the abutment members forming a pair of abutment surfaces facing inwardly of the constriction, providing an edge of an adjacent segment with a screw-threaded socket and a screw-threaded headed bolt in the socket projecting beyond said edge of the adjacent segment, positioning the segments edge-to-edge and inserting the bolt of the adjacent segment into the recess and moving the adjacent segment relative to said one segment thus moving the bolt to within the constriction, and tightening the bolt head in the socket to urge the bolt head against the abutment surfaces.

4,515,502
MARINE FENDERS

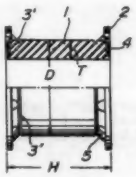
Shinichi Kajigaya, Yokosuka, and Mitsuo Nakaya, Yokohama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 312,064

Claims priority, application Japan, Oct. 27, 1980, 55-152108[U]

Int. Cl.³ E02B 3/22

U.S. Cl. 405—215 **9 Claims**



1. A marine fender comprising; a hollow cylindrical body composed of rubber or rubbery elastic material, one end of which having a securing flange for a quay wall, the other end of which having a fitting flange for a shock receiving member, an annular rigid reinforcing plate embedded in each of both the flanges, a fillet reinforcement provided on a foot portion of each of said flanges in said body and an annular groove formed in an outside wall of said hollow cylindrical body in a region adjacent to said fillet reinforcement at each end of said body within a range of 0.07H to 0.2H, wherein H is a distance between said flanges, as measured from each flange.

4,515,503
METHOD AND APPARATUS FOR UNBLOCKING CONVEYING PIPES FOR PARTICULATE MATERIAL

Brian Snowdon, Doncaster, England, assignor to Macawber Engineering Limited, Doncaster, England

PCT No. PCT/GB82/00078, § 371 Date Nov. 5, 1982, § 102(e) Date Nov. 5, 1982, PCT Pub. No. WO82/03066, PCT Pub. Date Sep. 16, 1982

PCT Filed Mar. 9, 1982, Ser. No. 441,517

Claims priority, application United Kingdom, Mar. 9, 1981, 8107284

Int. Cl.³ B65G 53/66

U.S. Cl. 406—11 **4 Claims**

1. Apparatus for unblocking conveying pipes for particulate material comprising:

means for injecting air into the pipe, said air injection means being located at positions along the pipe which are spaced apart by a distance less than the critical particulate material plug length to conveying pipe diameter ratio that will result in a pipe blockage that cannot be moved by application of pressure on the end of the particulate material plug; and

a plurality of pressure sensing means for detecting a pressure increase in the pipe above a predetermined level located at spaced apart positions along the conveying pipe, each air injection means being coupled to a first pressure sensing means, at a position upstream of the air injection means, and to a second pressure sensing means at a position downstream of the air injection means, the air injection means operating when the pressure detected by the first pressure sensing means is above the predetermined level, but not operating when the pressure detected at both the first and the second pressure sensing means is above said predetermined level;

the arrangements being such that the air injection means operate to ensure the reduction of the length of the particulate material blockage into lengths such that the critical ratio is not reached and such that, each air injection means is only operated when a particulate material blockage is located in the pipe in the region of the air injection means.

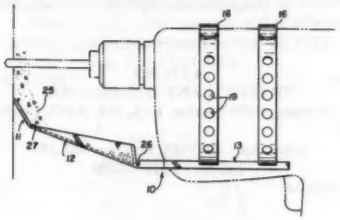
4,515,504
DEBRIS COLLECTOR

Ted E. Moore, Sr., 2310 SW. 34th Ave., Fort Lauderdale, Fla. 33312

Filed May 12, 1983, Ser. No. 493,941

Int. Cl.³ B23B 47/00

U.S. Cl. 408—67 **5 Claims**



1. A debris collector adapted to be fitted to a drill comprising a collection portion having a blade portion resiliently flexibly connected to a first end and an attachment portion resiliently flexibly connected to a second opposite end, said blade portion comprising a first flat rectangularly shaped surface, said collection portion comprising a flat truncated triangularly shaped surface having means associated therewith for retaining drilling debris, said attachment portion comprising a second flat rectangularly shaped surface having a "U" shaped cutout, therein emanating from the edge opposite said edge connected to said collection portion said cutout being adapted to be fitted to the body of said drill and means connected to said attachment portion for connecting said debris collector to said drill whereby said flexible connections allow the debris collector to collapse when said drill is being advanced into a work surface thereby allowing simultaneous collection of drilling debris.

4,515,505
PRESSURE FOOT ASSEMBLY FOR AN END MILL DELETE CUTTER

Richard C. Frisbie, Vestal; David E. Houser, Apalachin; Richard J. Morenus, Endwell, and Edwin L. Thomas, Apalachin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,421

Int. Cl.³ B23C 1/06, 9/00

U.S. Cl. 409—163 **3 Claims**

1. A pressure foot assembly for a rotatable end mill delete cutter mounted on a vertically movable slide assembly used to delete circuit land pads which are connected to circuit lines on a printed circuit panel, comprising:

pressure foot means attached to said slide assembly for receiving a cutter means therein, a cavity being defined by the boundaries of said pressure foot means in the bottom thereof;

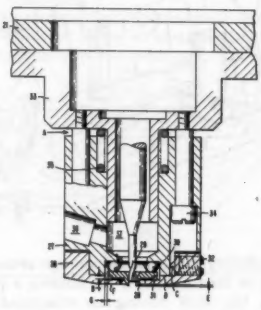
spring biased pressure ring means including a hole disposed through the approximate center thereof and retained within said cavity of said pressure foot means for holding

said circuit lines in place while said cutter means deletes at least a portion of the circuit line pad connected thereto, an inner surface of said hole being in substantial contact with said cutter means when said cutter means is disposed therein,

the periphery of said pressure ring means and an inner surface of said pressure foot means defining a clearance area,

said pressure ring means utilizing said clearance area to float within said cavity in order to maintain a concentric position with respect to said cutter means and to firmly hold said cutter means,

said pressure ring means floating into said concentric position with respect to said cutter means when said pressure



ring means contacts said circuit lines and maintaining said lines in place while the circuit land pad connected thereto is being deleted by said cutter means;

thrust ball bearing assembly means contained within said cavity and disposed between said pressure ring means and said pressure foot means for permitting said pressure ring means to float laterally within said cavity;

retainer ring means attached to the bottom of said pressure foot means; and

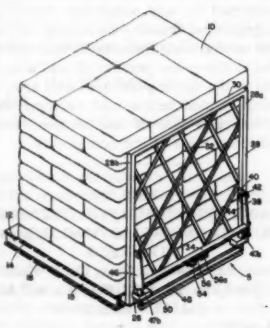
spring means disposed and compressed between said pressure ring means and said retainer ring means for supporting said pressure ring means up against said ball bearing assembly means.

4,515,506

PALLET CARGO RESTRAINING DEVICE

James Van Gompel, Fremont, Ind., and Ronald R. Akey, Footville, Wis., assignors to N P Marketing Corporation, Neenah, Wis.

Filed Apr. 20, 1982, Ser. No. 370,131
Int. Cl.³ B60P *1/64, 7/10;* B61D *45/00*
U.S. Cl. 410—46 **19 Claims**



1. A cargo restraining device for restraining a palletized cargo load on the underlying support floor of a vehicular carrier; said device comprising:

(a) a platform for receiving a pallet with a cargo load thereupon, said pallet being of the type including an upper load supporting surface and a lower surface separated from the upper surface by cross-ties, said platform being adapted for receipt between said upper and lower surfaces;

(b) a substantially vertical frame extending upwardly from one end of said platform;

(c) a horizontally-extending frictional member being pivotally connected to said frame and movable at the side of said frame which faces away from said platform, between a withdrawn position whereat the bottom of said member resides above the bottom of said pallet, and an extended position whereat the bottom of said frictional member extends beneath the bottom of said pallet and is displaced laterally away from said vertical frame and platform, the engagement of said member with said underlying support floor thereby effecting vertical tipping of said device away from the zone of engagement of said member with said floor, to thereby generate an increased contact force between the underlying support floor and the said horizontal frictional member, thereby restraining lateral relative movement between said pallet-carrying device snd said floor;

(d) handle means movable between first and second positions, for moving said horizontally-extending frictional member between said withdrawn and extended positions, said handle means being connected to said frame and said horizontally-extending member by a double pivot, which locks said member in its extended position when said handle means is at said second position; and

(e) means for releasably engaging said pallet, when said pallet is placed on said platform, thereby preventing movement of said pallet with respect to said platfrom and restraining device.

4,515,507

METHOD AND APPARATUS FOR HOLDING AND CENTERING ELECTRONIC COMPONENT

Koichi Asai, Nagoya; Mamoru Tsuda, Okazaki; Kunio Oe, and Yasuo Muto, both of Chiryu, all of Japan, assignors to Fuji Machine Mfg. Co., Ltd., Japan

Filed Aug. 22, 1983, Ser. No. 525,392
Claims priority, application Japan, Jun. 1, 1983, 58-97363
Int. Cl.³ B65G *47/91;* H05K *13/02*
U.S. Cl. 414—226 **20 Claims**

4. An apparatus for holding and centering an electronic component, comprising:

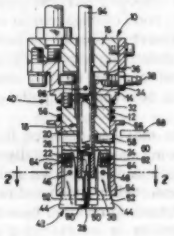
(a) a holder assembly including a holder body, and a sucker supported in engagement with said holder body for longitudinal movement relative to the same, said sucker having an air sucking passage open at an end face thereof for holding through suction said electronic component on said end face;

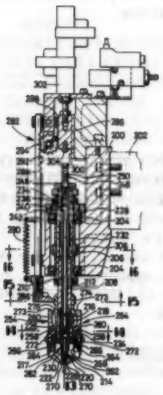
(b) sucker drive means for moving said sucker along a longitudinal centerline thereof between an advanced position at which said electronic component is sucked by said sucker, and a retracted position which is distant from said advanced position toward said holder body along said centerline;

(c) a first positioning unit including a first pair of positioning members which are supported by said holder body and movable from spaced-apart positions thereof toward each othr in a first direction substantially normal to said centerline of said sucker, in symmetrical relation with each other with respect to said centerline, said first pair of positioning members holding said electronic component on opposite sides thereof while the component is sucked by said sucker

at said retracted position, and thereby pushing said electronic component into alignment with said centerline of the sucker in said first direction;

(d) a second positioning unit including a support body which is separate from said holder body, said support body and said holder being movable relative to each other for temporary alignment with each other, said second positioning unit further including a second pair of positioning members which are supported by said support body and movable, upon said temporary alignment of said holder body with said support body, from spaced-apart positions thereof toward each other in a second direction substantially normal to said centerline of said sucker and said first direction, in symmetrical relation with each other with respect to said centerline, said second pair of positioning





members holding said electronic component on the other opposite sides thereof, and thereby pushing said electronic component into alignment with said centerline of the sucker in said second direction; and

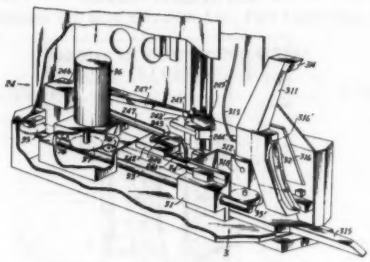
(e) positioning drive means associated with said first and second positioning units for moving said first pair of positioning members toward each other at one timing while said sucker is placed in said retracted position, and for moving said second pair of positioning members toward each other at another timing while said temporary alignment is established between said holder body and said support body, said drive means actuating each one of said first and second pairs of positioning members at least once while the other pair of positioning members are held in said spaced-apart positions.

4,515,508

ARTICLE AUTOMATIC STORAGE AND RETRIEVAL SYSTEM

Shunicti Takamatsu, Osaka, Japan, assignor to Itoki Kosakusho Co. Ltd., Osaka, Japan

Continuation of Ser. No. 252,349, Apr. 9, 1981, abandoned, which is a division of Ser. No. 889,522, Mar. 23, 1978, abandoned. This application Nov. 1, 1983, Ser. No. 547,457
Claims priority, application Japan, Mar. 26, 1977, 52-32794
Int. Cl.³ B65G 65/00; A47B 97/00
U.S. Cl. 414—280 **4 Claims**



1. A commodity retrieval and storage arrangement of the type having at least one shelf for holding a plurality of the commodity, the shelf having an elongated configuration whereby the plurality of the commodity is arranged along the elongated configuration, and a carriage displaceable along the elongated dimension of the shelf, the arrangement further comprising:

holding means for holding the commodity in place as the carriage is displaced, said holding means including a frame forming an enclosure which at least partially encloses the commodity held by said holding means, said frame including an opening therein facing said shelf, actuatable clamping mechanism mounted within said enclosure and having means for selectably engaging the commodity within the holding means for securing the commodity during displacement of the carriage said clamping mechanism comprising a pair of bias lever means pivotally mounted within said enclosure to engage opposite vertical sides of the commodity; and

retrieval means including guide means and a slide member with a forwardly extending arm displaceable along said guide means from a first position within said enclosure of said holding means to a second position exterior of said enclosure where contact is made with the commodity, said retrievel means including engagement means for engaging the commodity for transferring the commodity from the shelf to said holding means where the commodity is clamped by said actuatable clamping mechanism, said engagement means including an arm pivotally mounted to said slide member, a vacumm head pivotally mounted to the lower portion of said arm, a support pad mounted to the upper portion of said arm, said extending arm being located below said vacuum head and means located on each side of said vacuum head to prevent lateral displacement of the commodity.

4,515,509

METHOD AND APPARATUS FOR OPENING A LOADED PLASTIC BAG AND REMOVING THE CONTENTS THEREOF

James O. Frisz, 921 Pear St., Brea, Calif. 92621

Filed Feb. 17, 1983, Ser. No. 467,437
Int. Cl.³ B65B 69/00
U.S. Cl. 414—412 **8 Claims**

1. A method of removing the contents from a flexible-walled baglike container, which comprises the steps of:

moving the container along a define path on a surface;

moving a plurality of fingerlike members along a closed path including a first part extending transversely of the definite path and a consecutively adjacent second part extending vertically upward from the definite path;

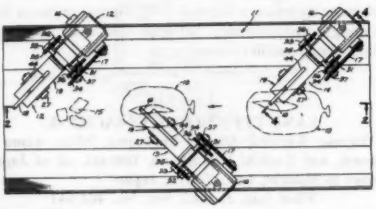
intercepting the container with the fingers as the container moves therepast to rupture the baglike container and initiate release of the contents onto said surface;

lifting the baglike container along the second part of the closed path while allowing the contents to fall from the ruptured container to said surface; and

dropping the baglike container back onto said surface to further rupture the bag and further release the contents.

4. Apparatus for removing the contents from a sealed baglike container, comprising:

a conveyor for moving the container along a predetermined path, said conveyor having an upwardly facing surface on which the container is received; and



a container treatment station located along the conveyor including,

a closed loop of sprocket chain mounted on sprocket wheels in a plane generally vertical to the conveyor flat surface, a plurality of finger means pivotally connected to the sprocket chain, means for driving the sprocket wheels to move the chain transversely across at least a portion of the conveyor flat surface and then vertically away from said surface at a predetermined point directly opposite said conveyor upwardly facing surface, and means for extending the finger means outwardly from the chain toward the conveyor during the transverse movement across conveyor portion to intercept and pierce the container with said finger means and lifting the intercepted and then pierced container during movement away from said conveyor surface so as to enable the contents to fall onto said conveyor.

4,515,510
SKIP TRAILER

Peter D. Heward, Islington via St. Germans, England; Valerie A. Jones, and John C. Jones, both of Johannesburg, South Africa, assignors to Crowcroft Engineering Limited, Ipswich, England

Filed Jul. 15, 1982, Ser. No. 398,622

Claims priority, application United Kingdom, Jul. 17, 1981, 8122104

Int. Cl.³ B65G *65/23*

U.S. Cl. 414—422 **12 Claims**

1. A trailer for towing by motorized vehicle, the trailer comprising:

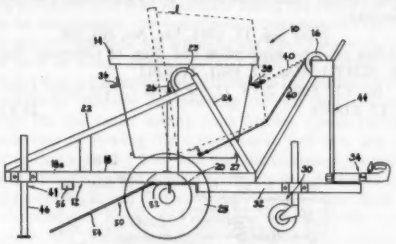
a frame;

a pair of road wheels mounted on said frame;

a receptacle for receiving a load being pivotably mountable on the frame; said receptacle having respective spaced apart bearing surfaces for supporting said receptacle on the frame;

means for enabling said receptacle to be mounted onto and demounted from the trailer comprising respective ramp means fixedly mounted on said frame at each side of said frame for engaging beneath said respective bearing surfaces and enabling said receptacle to be lifted and drawn onto said frame to a position wherein said receptacle is fully supported by said frame, and lowered from said frame;

and means connectible to a first position on said receptacle



for assisting mounting and demounting of said receptacle and connectible to a second position on said receptacle for enabling said assisting means to pivot said receptacle relative to said ramp for discharging said load therefrom.

4,515,511
AXIAL FAN WITH BLADES THAT AUTOMATICALLY ADJUST TO THE DIRECTION OF ROTATION

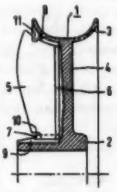
Manfred Heerlein, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,209

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248760

Int. Cl.³ F04D *29/36*

U.S. Cl. 416—131 **3 Claims**



1. In an axial fan of the type having a fan wheel having a hub, outwardly extending spokes aligned on said hub, a fan blade attached by a film hinge to each of said spokes with freedom to swivel whereby the freedom of said blades to swivel is limited by stops provided by the fan wheel, the improvement comprising:

said fan wheel being made of one piece of plastic material wherein said hub is centrally located as part of said one-piece fan wheel and a plurality of spokes are integrally connected to and extend outwardly from said hub and part of said one-piece fan wheel;

a guide ring circumferentially located to said spokes and said hub and integrally connected to said spokes;

two first locking elements are integrally connected to said hub and said stops located symmetrically on either side of each said spoke; and

two second locking elements are integrally connected to said guide ring located symmetrically on either side of said spokes, said first and second locking elements engaging said fan blades in either of two positions limited by said stops providing a position lock with said blades in an axial direction.

4,515,512

SEAL FOR HIGH PRESSURE PUMP OR THE LIKE

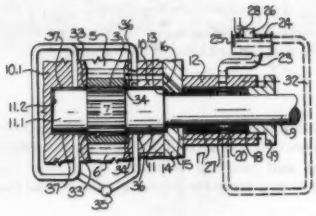
Siegfried Hertell, Radevormwald, and Artur Hager, RS-Lüttringhausen, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,408

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034371; Mar. 17, 1981, 3110241

Int. Cl.³ F04C *2/18, 15/00;* **F16J** *15/40;* **B29F** *3/08*

U.S. Cl. 418—1 **28 Claims**



1. A method of sealing the drive shaft in the housing of a gear pump or the like, and which is adapted to convey melted polymeric materials, and comprising the steps of

feeding a heated and melted polymeric material to the pump, while

rotating the drive shaft to convey the material through the pump under a relatively high pressure, while

supplying heat to the pump to maintain the heated and melted condition of the polymeric material,

maintaining an annular zone of relatively low pressure between the drive shaft and housing adjacent the inner end of the shaft, maintaining an annular packing seal between the shaft and housing immediately adjacent the outer side of said low pressure zone, maintaining an annular liquid filled chamber between the shaft and housing immediately adjacent the outer side of said packing seal, with said liquid in said chamber being a solvent for the polymeric material, and maintaining the liquid in the annular chamber at a pressure greater than the pressure in the low pressure zone.

4,515,513

ROTARY COMPRESSOR WITH INNER AND OUTER CYLINDERS AND AXIAL INSERT TYPE DISCHARGE VALVES

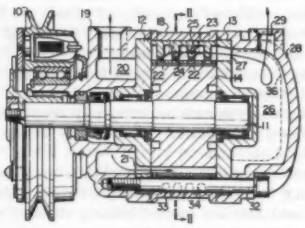
Isao Hayase; Masao Mizukami, and Atsuo Kishi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 16, 1983, Ser. No. 495,147

Claims priority, application Japan, May 19, 1982, 57-83124

Int. Cl.³ F04C *18/00, 29/00, 29/04*

U.S. Cl. 418—101 **9 Claims**



1. A rotary compressor comprising:

a rotor;

a cylinder having an inner surface slidably contacting said rotor at one or more portions thereof;

side plates disposed on both sides of said cylinder for supporting a rotor driving shaft;

one or more compression chambers defined by said rotor, said cylinder and said side plates;

axial openings formed in said cylinder; and

axial insert type discharge valves disposed inside said axial openings,

wherein said cylinder includes an inner cylinder having an inner surface slidably contacting said rotor, and an outer cylinder surrounding the whole of an outer periphery of said inner cylinder,

said inner cylinder and said outer cylinder are inseparably connected with each other,

said axial openings each include an inner surface defined by said inner cylinder and said outer cylinder, and

said inner cylinder is formed with discharge bores for providing communication between said axial openings and said compression chambers.

4,515,514

VANE-TYPE ROTARY MACHINE

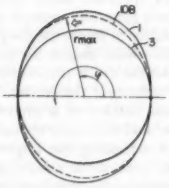
Isao Hayase, Katsuta; Atsushi Suginuma, Mito; Atsuo Kishi, Katsuta, and Kenichi Kawashima, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,647

Claims priority, application Japan, Aug. 12, 1981, 56-125226

Int. Cl.³ F03C *2/00;* **F04C** *18/00*

U.S. Cl. 418—150 **2 Claims**



1. A vane-type rotary machine comprising: a cam ring having an inner peripheral surface contour expressed by an epitrocoid-like curve having n lobes; a cylindrical rotor having a plurality of vane grooves and contacting the inner peripheral surface contour of said cam ring; and vanes slidably received by said vane grooves and adapted to slide on the inner peripheral surface contour of said cam ring as said rotor rotates, the inner peripheral surface contour of said cam ring is constructed such that a center angle formed around a center of said rotor and between a point at which said rotor contacts said cam ring at a point forming a position of maximum projection of the vane located at a leading side of the point of contact, as viewed in a direction of rotation of the rotor, exceeds an angle π/n by an amount increasing with an amount of offset of said vanes so as to enable a smooth substantially sinusoidal movement of the vanes upon rotation of the rotor.

4,515,515

COMPRESSOR SERVOMECHANICAL REGULATOR

Jean-Marc Segonne, Meyzieu, France, assignor to 501 Maco Meudon Chemin de Genas, France

Filed Oct. 27, 1982, Ser. No. 436,909

Claims priority, application France, Oct. 27, 1981, 81 20542

Int. Cl.³ F04B *49/02*

U.S. Cl. 417—26 **20 Claims**

1. An intake regulator for a compressor having a compressor inlet, a compressor outlet, a compressor motor, and compressor means selectively operable to draw fluids from said inlet,

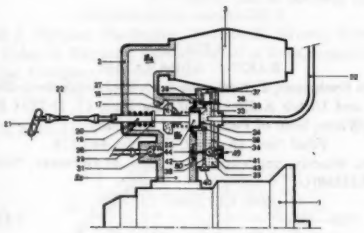
pressure said fluid and direct said pressurized fluid to said compressor outlet, said regulator comprising:

a main body;

a main passageway extending through said main body and having a passageway inlet and a passageway outlet, said passageway outlet being interconnected with said compressor inlet for fluid flow therebetween;

valve means disposed along said main passageway selectively operable to close said main passageway, said valve means being biased upon in response to the operation of said compressor means;

a stem member movably mounted in said main passageway, said stem member having a first portion extending from and passing through said valve means, said stem member further having a second portion extending from said main



body such that reciprocation of said second portion of said stem member controls the operation of said compressor motor;

abutment means disposed on said stem member;

biasing means for biasing said valve means towards a closed condition such that the amount of fluid flowing through said valve means is dependent on the suction created by said compressor means at said compressor inlet;

biasing means adjustment means selectively operable to adjust said biasing means in response to changes in the pressure at said compressor outlet; and

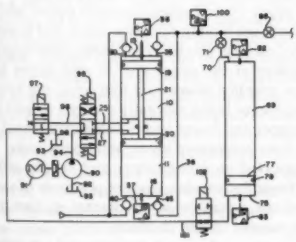
a flexible diaphragm interposed said main passageway and said biasing means adjustment means, said abutment means being biased by said diaphragm against the force of said biasing means in response to the pressure level of said biasing means adjustment means.

4,515,516

METHOD AND APPARATUS FOR COMPRESSING GASES

Paul M. Perrine, and Carol-Anne Perrine, both of Salt Lake County, Utah, assignors to Champion, Perrine & Associates, Englewood, Colo.

Filed Sep. 30, 1981, Ser. No. 306,890
Int. Cl.³ F04B *35/02*
U.S. Cl. 417—38 **36 Claims**



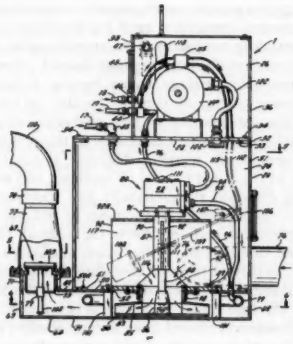
1. A high pressure compression system for compressing natural gas to a pressure sufficient for filling the pressure tank of a vehicle adapted to run on natural gas comprising a gas storage tank having the capability to transfer substantially its entire contents of stored gas to the pressure tank; an inlet-outlet for compressed gas at one end of the storage tank; at least one closed container; gas inlet means for filling the container with gas to be compressed; gas outlet means connected to the inlet of the gas storage tank for allowing the gas to leave the container as it is being compressed and enter the storage tank; means for forcing a compression fluid into the container to fill the container, thereby compressing the gas and forcing it through the gas outlet means, such forcing means having a variable rate of forcing the compression fluid into the container so that a greater flow rate into the container is obtained when the fluid is forced against relatively low pressures compared to the maximum desired pressure and a lesser flow rate into the container is obtained when the fluid is forced against relatively high pressures; means for draining the container of the compression fluid while again filling the container with gas to be compressed; means for alternately operating the forcing means and draining means until a desired pressure of gas has been obtained in the gas storage tank; means for connecting the outlet of the gas storage tank to the pressure tank to be filled; and means for progressively lessening the storage area of the storage tank while gas is allowed to leave the storage tank, thereby forcing the gas stored in the storage tank out of the tank and into the pressure tank.

4,515,517

WELL POINT SYSTEM AND APPARATUS

Albert H. Sloan, 4201 Kean Rd., Fort Lauderdale, Fla. 33314

Filed May 25, 1983, Ser. No. 497,838
Int. Cl.³ F04B *49/04, 23/08*
U.S. Cl. 417—46 **22 Claims**



1. A hydraulic well point pumping system comprising conduit means extending over an area of ground to be drained of water and having well point means extending into the ground for extracting water therefrom, water pump apparatus connected to said conduit means for pumping water from said conduit means, said apparatus comprising

an enclosed tank locatable adjacent said well point means and having a water inlet and a water outlet,

a closed impeller type water pump assembly in said tank and including a pump having an impeller and a shaft fixed thereto and rotatable about a vertical axis, said pump having an inlet eye facing in an upward direction for the reception of gravity-fed water downwardly into said impeller, said impeller shaft extending upwardly and having an upper end, and a hydraulically driven fluid motor secured to said shaft upper end for rotatably driving said impeller about said vertical axis,

fluid passage means between the discharge of said pump impeller and said outlet of said tank, one-way check valve means at said discharge of said impeller,

said tank also including a vacuum pump chamber in said tank and having a vacuum pump therein for creating said vacuum in said tank to thereby induct water into said tank through said inlet, and means for driving said vacuum pump, a remote speed control valve for regulating the speed of said vacuum pump, float control means in said tank, for actuating said remote speed control valve,

and a power source means locatable remotely from said tank and including a power driven hydraulic pump, and conduit means connected between said power driven hydraulic pump and said fluid motor of said impeller in said tank whereby said pump can remotely drive said motor.

4,515,518

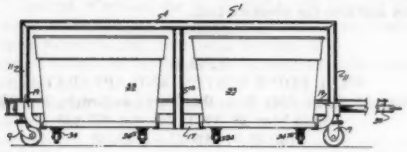
TOWABLE, HYDRAULICALLY POWERED LIFTING AND TRANSPORT TRAILER

Jerry R. Gilbert; Robert C. Millikan, both of Macon; Charles H. Wysowski, Warner Robins, and John R. Pyburn, Jr., Macon, all of Ga., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jun. 6, 1983, Ser. No. 501,578

Int. Cl.³ B60P *3/00*

U.S. Cl. 414—459 **2 Claims**



1. A transport assembly arrangement comprising: a plurality of caster mounted containers, each having horizontal support members extending outwardly from opposite sides thereof at a position spaced from the bottom plane thereof; a longitudinally extending movable carriage frame having a longitudinally extending lower central rib member located on the longitudinal axis of the carriage frame, two elongated structural end members each one of which is located at the opposite ends of the lower central rib member disposed symmetrically and transversely to the lower central rib member, and an elongated center guide disposed symmetrically and transversely to the lower center rib in parallel relationship to and equally spaced from the structural end members; the central rib member, structural end members and center guide mutually cooperating to define a plurality of recesses extending along opposite sides of the longitudinal axis thereof and open to the longitudinal sides of the carriage frame, each recess being sized to receive one of said containers moved from stations located on opposite sides of the line of movement of said carriage frame; horizontal rail support members extending along the elongated structural end members and projecting inwardly of the adjacent recess toward the center guide and two horizontal support members extending along the central rib member on opposite longitudinal sides thereof and projecting inwardly of the adjacent recess toward the rail support member to the opposite side of the recess therefrom so that each of said recesses has spaced opposed elongated rail support members mounted on said carriage frame along the longitudinal sides of each said recess sloping downwardly in a direction toward the central rib member and positioned to extend below said support members of one of said containers when positioned in said recess; a set of spaced casters, each of said casters being disposed at the free end of each one of the horizontal support members such that a caster is located at each corner of said carriage frame; a pair of horizontal, longitudinally extending spaced parallel side bars located to each longitudinal side of the lower center rib, each side bar being located above the free ends of the rail support members and center guide by a distance greater than the height of the container; a vertical corner riser extending from each free end of each horizontal support member to said side bar located thereabove to support said horizontal support member, and a vertical hanger bar extending from each free end of said center guide to said side bar located thereabove to support said horizontal support member; a set of vertically extensible and collapsible lift assemblies, one for each caster including inner and outer telescoping sleeves, one of which sleeves is connected to the free end of each of said horizontal support members of said carriage frame and the other to one of said casters; an hydraulic system to simultaneously activate said lift assemblies, including a set of hydraulically operated cylinders and pistons, each of said pistons cooperating with one end of each of said vertically extensible and collapsible lift assemblies to simultaneously extend and collapse the same; and a set of resilient stops mounted to said lower central rib member to extend into each of said recesses to cushion the bump of a container inserted in said recess.

4,515,519

RAKING APPARATUS

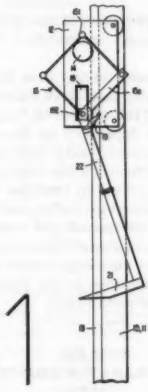
Heinrich Bachmann, Erlenstrasse 6, D-7542 Schömberg-Bieselsberg, and Ulrich Kollmar, Auf dem Berg 17, D-7531 Pforzheim-Würm, both of Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,124

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1981, 8133468[U]

Int. Cl.³ B66C *23/02*

U.S. Cl. 414—680 **7 Claims**



1. A raking apparatus comprising:

(a) a generally vertically oriented guide track;

(b) a carriage supported on the guide track for displacement thereon along a traveling path;

(c) means for displacing said carriage on said guide track;

(d) a linkage assembly supported on said carriage and comprising an upper lever having opposite upper and lower ends, a lower lever having opposite upper and lower ends, a stationary first joint pivotally mounting said upper lever to said carriage at the upper end of said upper lever, a second joint attached below said first joint; the lower end of said lower lever being pivotally secured to said second joint; said upper and lower levers being articulated to one another at their respective lower and upper ends;

(e) a rake supported on said carriage and rigidly affixed to said lower lever for varying angular positions of said rake by said linkage assembly upon pivotal motion of said levers with respect to one another;

(f) a slide track mounted on said carriage and receiving said second joint for guiding said second joint for sliding motion towards or away from said first joint upon said pivotal motion of said upper and lower levers;

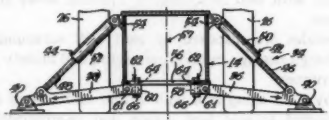
(g) locking means mounted on said carriage and cooperating with said lower lever; said locking means having a released position permitting said pivotal motion of said levers and a locking position immobilizing said levers with respect to one another in a predetermined angular position of said rake; and

(h) stop means stationarily supported along said guide track at a predetermined location for abutting said second joint and displacing said second joint upwardly along said slide track with respect to said carriage during travel of said carriage through a predetermined length and location of said traveling path, whereby pivotal motion of said levers is effected for pivoting said rake into said predetermined angular position.

4,515,520
STABILIZER ASSEMBLY

Donald J. Parquet, Burlington; Thomas R. Brown, Yarmouth, and Eldon R. Edwards, Burlington, all of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Sep. 13, 1982, Ser. No. 417,328
Int. Cl.³ E02F 9/00
U.S. Cl. 414—718 **4 Claims**



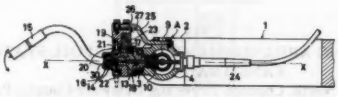
1. In a mobile heavy vehicle having a frame with a load lifting boom, an improved stabilizer assembly having a pair of stabilizers positioned one on each side of the vehicle to provide stabilization against tipping of the vehicle comprising: an anchor for stabilizing each of said stabilizers, means mounting each of said anchors to a lower portion of said frame so as to permit selective transverse positioning thereof on either side of the longitudinal center line of the vehicle including cooperating slot means defined by said frame and retaining means for positively positioning each anchor relative to the frame in a preselected position on either side of said longitudinal center line; first and second stabilizer legs having inboard ends which are pivotally secured to its respective stabilizer anchor and outboard ends which are respectively pivotally secured to first and second stabilizer pads; first and second stabilizer cylinders having first ends which are pivotally secured to upper portions of said frame, one on each side of said longitudinal center line, and second ends which are respectively pivotally secured to said first and second stabilizer legs for selectively moving the outboard ends of said stabilizer legs between raised and lowered positions, wherein said transverse positioning of said stabilizer anchors permits positioning of said first and second stabilizer pads between a retracted position nearer said longitudinal center line and an extended position farther from said longitudinal center line.

4. In a mobile heavy vehicle having a frame with a load lifting boom, an improved stabilizer assembly having a pair of stabilizers positioned one on each side of the vehicle to provide stabilization against tipping of the vehicle; comprising: a stabilizer anchor slidably mounted on a transverse rail member secured to a lower portion of said frame so as to permit selective transverse positioning thereof on either side of the longitudinal center line of the vehicle; first and second stabilizer legs having inboard ends which are pivotally secured to said stabilizer anchor and outboard ends which are respectively pivotally secured to first and second stabilizer pads; first and second stabilizer cylinders having first ends which are pivotally secured to upper portions of said frame, one on each side of said longitudinal center line, and second ends which are respectively pivotally secured to said first and second stabilizer legs for selectively moving the outboard ends of said stabilizer legs between raised and lowered positions; and retaining means including a hydraulic clamp means including a clamp piston associated with said stabilizer anchor for clamping the stabilizer anchor to said rail member for selectively retaining said stabilizer anchor in a preselected position on either side of said longitudinal center line, wherein said transverse positioning of said stabilizer anchor permits positioning of said first and second stabilizer pads between a retracted position nearer said longitudinal center line and an extended position farther from said longitudinal center line.

4,515,521
WELDING TORCH APPARATUS

Tadashi Takeo, Sakado; Toru Yamamoto, and Sachihiro Yamashito, both of Hidaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1982, Ser. No. 346,935
Claims priority, application Japan, Feb. 6, 1981, 56-14923; Feb. 6, 1981, 56-15824
Int. Cl.³ B23K 9/12
U.S. Cl. 414—735 **4 Claims**



1. In a welding torch in combination with an industrial robot, the industrial robot having an arm and a wrist means at one end thereof, the wrist means including a rotary casing means having a rotary shaft extending in a direction along the axis of said arm and a pair of sprocket members disposed on the sides of said rotary shaft said rotary casing means having a conduit cable attached to a rear surface thereof, said conduit cable disposed coaxially with said rotary shaft; the improvement comprising a first central core wire guide means within said rotary shaft and extending along the axis thereof said first central core guide means being coaxial with said conduit cable and extending to cover the portion of the conduit cable attached to said rotary casing means, and a second central core wire guide means within said welding torch and fixed to said rotary shaft, said second central core wire guide means being axially aligned and colinear with and in communication with said first central core wire guide means such that no corners are present in the path of a welding core wire and such a welding core wire disposed within said first and second wire guide means may travel along the lengths thereof without being severely twisted between said first and second central core wire guide means, despite the motion of the welding torch.

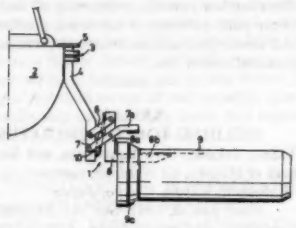
4,515,522
PIPELAYING APPLIANCE

John T. Sonerud, Vintervägen 30, Hudiksvall, Sweden

Filed Jan. 19, 1983, Ser. No. 459,118
Int. Cl.³ E02F 5/00
U.S. Cl. 414—747 **6 Claims**

1. A pipelaying appliance, connected to a raisable and lowerable apparatus such as an excavator or a crane, and including a gripping means for removable engagement with a pipe, said means comprising a first member projecting into the pipe and an opposing second member on the outside of said pipe, said first and second members being movable to and from each other and connected to said appliance so that the clamping force provided by said first and second members on the wall of said pipe will be proportional to the weight of said pipe carried by said gripping means, characterized by a spring means exerting a force on both said first and second members for the mutual displacement thereof when they are not in engagement with said pipe, the weight of which substantially exceeds this

force, wherein the first member is L-shaped with a substantially horizontal arm engaging said pipe and a substantially vertical arm parallel to a third member on said appliance, said



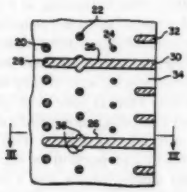
third member being connected to said raisable and lowerable apparatus and movably connected to said vertical arm via a link and a portion of said second member parallel to said link.

4,515,523

COOLING ARRANGEMENT FOR AIRFOIL STATOR VANE TRAILING EDGE

William E. North, Concord Township, Delaware County; Paul C. Holden, Newtown, and Kent G. Hultgren, Swarthmore, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 28, 1983, Ser. No. 547,292
Int. Cl.³ F01D 5/14
U.S. Cl. 415—115 **3 Claims**



1. In a turbine airfoil-shaped stator vane of thin wall design having internal pin fins in staggered rows extending between the opposite walls of the vane in the area closely upstream from spanwise openings formed in the trailing edge of the vane, the improvement comprising:

a series of first ribs having a height to extend completely between and to connect said opposite walls of said vane to each other and extending longitudinally in a flowwise direction in intersecting relation to said staggered rows of pin fins but out of intersecting relation with any individual ones of said pin fins, said ribs including spanwise protruding means thereon for inducing turbulent air flow at locations therealong corresponding to the locations of pin fins displaced by the presence of said ribs.

4,515,524

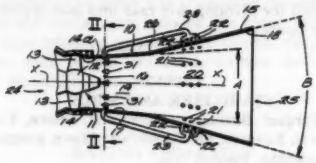
DRAFT TUBE FOR HYDRAULIC TURBINE

Richard K. Fisher, Jr., Jacobus, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 27, 1982, Ser. No. 423,534
Int. Cl.³ F04D 29/40
U.S. Cl. 415—219 R **5 Claims**

1. A draft tube for discharging water from a hydraulic turbine having a turbine runner rotatable about an axis of rotation; said draft tube having a wall defining a discharge passage diverging from said runner to a discharge opening; said draft tube having a first region downstream of said runner with said first region having a rate of divergence less than that at which boundary layer separation occurs; said draft tube also having a second region downstream of said first region and continuously connected thereto with said second region having a rate of divergence greater than that at which boundary layer separation would normally occur; said draft tube wall surrounding said discharge passage in said second region being provided with a plurality of orifices therethrough;

a plurality of nozzles disposed within said first region; said nozzles having a fluid inlet in water flow communication with said orifices; said nozzles having fluid outlets in



communication with said discharge passage in said first region with said fluid outlets opening away from said runner;

said nozzles are disposed on said wall surrounding said discharge passage in said first region and closely adjacent said runner

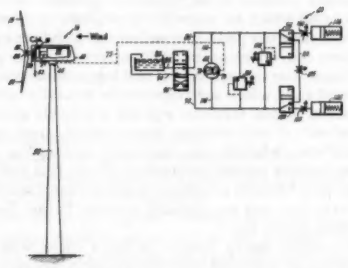
whereby fluid along said wall within said second region is conducted to said first region and re-admitted to said discharge passage thereby reducing boundary layer separation in said second region.

4,515,525

MINIMIZATION OF THE EFFECTS OF YAW OSCILLATIONS IN WIND TURBINES

Glidden S. Doman, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 8, 1982, Ser. No. 440,056
Int. Cl.³ F03D 7/04
U.S. Cl. 416—11 **12 Claims**



1. In a wind turbine comprising a plurality of airfoil blades mounted on a rotatable hub, said wind turbine being mounted on a flexible cantilever tower and having a center of mass longitudinally offset therefrom and being pivotable about a yaw axis through said tower, the improvement characterized by:

drive means mounted on said tower, means connecting said drive means to said wind turbine whereby said wind turbine may be positively driven in yaw by said drive means, said drive means including as an integral part thereof, driven means connected to said wind turbine, said driven means at selected yaw conditions of said wind turbine being drivable through said connecting means by yaw oscillations of said wind turbine resulting from lateral

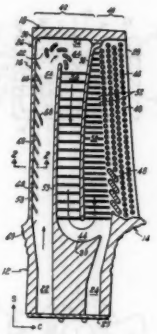
bending of said tower for the damping of such yaw oscillations by the dissipation of energy associated therewith.

4,515,526

COOLABLE AIRFOIL FOR A ROTARY MACHINE

James L. Levengood, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,616
Int. Cl.³ F01D *5/18*
U.S. Cl. 416—96 R **8 Claims**



1. In a coolable airfoil adapted for use in a rotary machine of the type having a cooling air passage and a wall in the leading edge region bounding the passage for cooling air, the improvement which comprises:

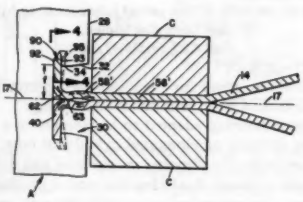
at least one trip strip which extends across the passage and from the wall in the leading edge region which is canted towards the approaching flow and which forms an acute angle with respect to the wall, the trip strip having a vortex generator integrally formed with the trip strip which increases the height of the strip, which permits flow over the vortex generator and which is spaced chordwisely from the wall in the leading edge region to permit flow by the vortex generator over the trip strip.

4,515,527

CENTER PLATE-BLADE INTERCONNECTION ON A CENTRIFUGAL BLOWER WHEEL

Harold L. Baker, Cleveland, Ohio, assignor to Morrison Products, Inc., Cleveland, Ohio

Filed Jun. 18, 1982, Ser. No. 389,757
Int. Cl.³ F04D *29/28*
U.S. Cl. 416—184 **14 Claims**



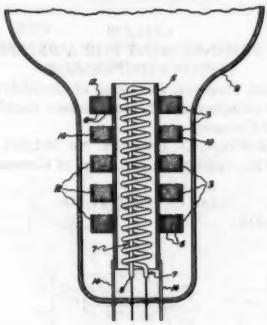
1. In a centrifugal type blower wheel comprised of a plurality of axially-extending, circumferentially-spaced blower blades and a central supporting plate comprised of a pair of axially abutting discs, each blade having on its inner edge of T-shaped notch consisting of a T-leg defined by a radially extending opening and a T-head defined by a radially inwardly facing side surface, spaced opposed axially facing base surfaces, and axially spaced radially outwardly facing side surfaces one on each side of said T-leg, said surfaces forming an axially extending slot at the base of the notch, the improvement which comprises: radially outer portions of the discs abutting within the notch and having further outer portions extending generally parallel to the axis into said slots.

4,515,528

HYDROCARBON GETTER PUMP

James R. Young, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1983, Ser. No. 511,061
Int. Cl.³ F04B *37/02*
U.S. Cl. 417—51 **5 Claims**



1. A hydrocarbon getter pump for use within a vacuum or inert atmosphere, comprising:

getter material comprising an active metal alloy capable of gettering hydrogen;

a nickel catalyst for dissociating hydrocarbons selected from the group consisting of powdered passivated nickel and granular passivated nickel; and

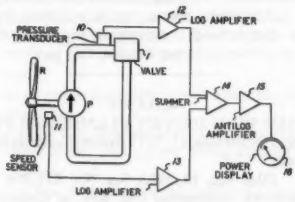
means for heating said getter material and said nickel catalyst to approximately 300°–500° C.

4,515,529

ENERGY TRANSDUCER FOR HYDRAULIC WIND POWER CONVERSION SYSTEM AND INSTRUMENTATION THEREFOR

William M. Woodhull, 1815 Ridge Rd., Ontario, N.Y. 14519

Filed Oct. 21, 1982, Ser. No. 435,773
Int. Cl.³ F04B *21/00*
U.S. Cl. 417—63 **1 Claim**



1. A system for determining and optimizing the power developed in an associated wind rotor operatively connected to a hydraulic pump to motivate hydraulic fluid through an orificed hydraulic system, including:

speed sensing means to measure operating speed N of said pump and to transmit speed signal information,

pressure sensing means to measure hydraulic pressure P

developed by said pump and to transmit pressure signal information,

multiplication means to multiply said speed signal information and said pressure signal information to thereby generate a product power signal N×P indicative of the power W developed in said pump according to the relationship:

Power WαSpeed N×Pressure P,

readout means responsive to said power signal to indicate the power developed in said pump,

said orifice in said hydraulic system being adjustable to vary said hydraulic pressure and said operating speed to thereby vary the power developed in said pump, and

means to set said orifice at the size corresponding to the maximum of power developed.

4,515,530

DISABLING ARRANGEMENT FOR A RECIPROCATING PISTON COMPRESSOR

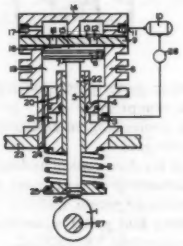
Arno Christoleit, Hanover, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,935

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243165

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—214 **9 Claims**



1. An arrangement for disabling the movement of a reciprocating piston of a pneumatic compressor comprising, a cylinder housing having a compression chamber, a compression piston disposed in said compression chamber and having an operating tappet, a rotating cam engaging said operating tappet for driving said compression piston through a compression stroke, a restoring spring biasing said operating tappet against said rotating cam for driving said compression piston through a suction stroke, and an auxiliary piston concentrically disposed about said operating tappet and cooperatively associated with said compression piston and acted upon by a control pressure to disable said compression piston by holding said compression piston in its top dead center position.

4,515,531

SWASH RING DRIVEN DIAPHRAGM PUMP

Erich Roser, Dorfstrasse 17, 7777 Salem-Grasbeuren, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,670

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3233987

Int. Cl.³ F04B *1/16*; F16H *23/04*

U.S. Cl. 417—269 **6 Claims**

1. A diaphragm pump driven by a swash ring, comprising:

a drive shaft having an axis;

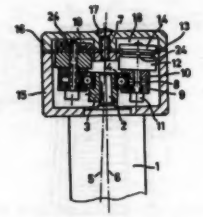
a ball bearing having an axis, said ball bearing including inner and outer races;

a hub-like bearing member mounting said inner race to said shaft so that the axis of said shaft and the axis of said ball bearing intersect, at a small angle, at a first point spaced apart from said ball bearing;

a tightly clamped diaphragm;

a plurality of wobble fingers operationally connected to said diaphragm, each wobble finger including an elongated connecting element which has an axis that penetrates said diaphragm at a second point; and

clamping means acting in the direction of the ball bearing axis for mounting said wobble fingers to said outer race of said ball bearing so that said second points move along



paths having center positions and so that said second points, at their center positions, lie in a plane that is perpendicular to the axis of said shaft and that passes through said first point,

wherein said clamping means individually mounts said wobble fingers and includes, for each wobble finger, a pair of radially disposed clamping claws which are tightened against said outer race of said ball bearing by said elongated connecting element, each claw of the pair having an inner end with a flange which extends between said inner and outer races of said ball bearing.

4,515,532

SINGLE ACTION PNEUMATIC POWERED SPRING RETRACTABLE PUMP

John B. Walling, P.O. Box 16266, Fort Worth, Tex. 76133

Division of Ser. No. 344,359, Feb. 1, 1982, Pat. No. 4,445,819.

This application Dec. 12, 1983, Ser. No. 560,315

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.³ F04B *41/08*

U.S. Cl. 417—318 **4 Claims**

1. A downhole pump for pumping well production fluids and the like from a well, said pump comprising:

an elongated housing adapted to be inserted in a well, said housing defining an elongated cylindrical bore;

a piston reciprocably disposed in said bore and dividing said bore into a power fluid chamber and a production fluid chamber, said piston being movable through an extension stroke and a retraction stroke with respect to said production fluid chamber to discharge and intake fluid with respect to said production fluid chamber, respectively;

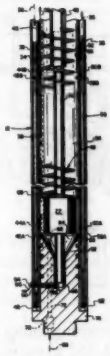
means forming an inlet port opening into said production fluid chamber for admitting fluid to said production fluid chamber, and means forming a discharge port for conducting fluid out of said production fluid chamber;

first valve means for introducing power fluid into said

power fluid chamber for causing said piston to move through said production fluid chamber on an extension stroke to deliver a charge of fluid through said discharge port;

second valve means for venting power fluid from said power fluid chamber;

means operable to be actuated by said piston at a predetermined point on said extension stroke to cause said first valve means to close off communication of power fluid to said power fluid chamber, and to cause said second valve means to vent power fluid from said power fluid chamber;



an end block of said housing including a sand trap chamber formed therein;

third valve means for venting said sand trap chamber, said third valve means being actuated by means during an extension stroke of said piston to vent fluid from said sand trap chamber; and,

said piston including a piston part operable to extend into said sand trap chamber during an extension stroke of said piston to substantially isolate said sand trap chamber from said production fluid chamber and to displace fluid in said sand trap chamber through said third valve means.

4,515,533

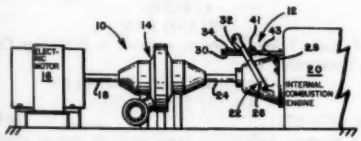
CLUTCH LEVER RETAINING MECHANISM

Abelicio Gomez, 5738 Wood Dr. SW., Albuy, N. Mex. 87615

Filed Feb. 16, 1984, Ser. No. 580,978

Int. Cl.³ F04B *49/10, 9/00*

U.S. Cl. 417—319 **8 Claims**



1. In a pumping system having a pump, an electric motor operably connected to said pump for normally operating said pump, an internal combustion engine operably connected to said pump for operating said pump during nonoperation of said electric motor, a clutch mechanism operably interconnected between said pump and said internal combustion engine, and said clutch mechanism including a housing and a clutch lever for selectively engaging or disengaging said clutch mechanism, the improvement therein being in the form of a clutch lever retaining mechanism, said retaining mechanism comprising a mounting bracket secured to said clutch mechanism housing adjacent said clutch lever; a support bracket adjustably mounted on said mounting bracket; a latch member pivotally secured to said support bracket, said latch member having a notch therein, and being positioned such that said notch engages said clutch lever in a preselected position; and means interconnected between said support bracket and said latch member for selectively maintaining said latch member in said preselected position in order to prevent the movement of said clutch lever and for selectively releasing said latch member for movement to another position in which said clutch lever is free to move.

4,515,534

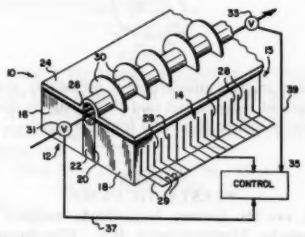
MINIATURE SOLID-STATE GAS COMPRESSOR

William N. Lawless, 518 Illinois Ct., Westerville, Ohio 43081; Leslie E. Cross, 401 Glenn Rd., State College, Pa. 16801, and William A. Steyert, c/o Oakhurst Dr., R.D. 1, Box 99, Center Valley, Pa. 18034

Filed Sep. 30, 1982, Ser. No. 431,447

Int. Cl.³ F04B *35/04, 45/08*

U.S. Cl. 417—322 **16 Claims**



1. An apparatus for compressing a gas, comprising:

a block of electrostrictive or piezoelectric ceramic material having a first end;

an elastomer disposed along said first end of said block;

means defining a channel having said elastomer as at least one wall thereof;

means for selectively applying an electric field to said block; and

means constraining said block such that application of said electric field to said block causes displacement thereof against said elastomer, extruding said elastomer into a closed relationship with said channel defining means.

4,515,535

PERISTALTIC PUMP QUICK DISCONNECT ROTOR ASSEMBLY

Edmund D. D'Silva, Round Lake Beach, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 15, 1983, Ser. No. 523,496

Int. Cl.³ F04B *17/00, 43/12*

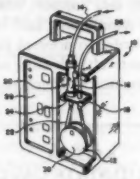
U.S. Cl. 417—360 **3 Claims**

1. An improved quick disconnect rotor assembly for peristaltic pumps, comprising:

a carrier having a first configuration and being attachable to a pump drive shaft, said carrier being formed with first magnetic means; and

a rotor having means defining a second configuration which mates with said first configuration when said carrier and said rotor are mounted together in either a first orientation or a second orientation spaced 180 degrees from said first orientation, said rotor mating means further having second magnetic means therein for magnetically coupling with said first magnetic means when said carrier and said rotor are mounted together in one of said first and second orientations, said second magnetic means including first and second magnets, each presenting a north magnetic

pole, and third and fourth magnets, each presenting a south magnetic pole, said magnets being equally radially spaced from the center of said rotor mating means with



said first magnet diametrically oppositely spaced from said second magnet and said third magnet diametrically oppositely spaced from said fourth magnet.

4,515,536

PERSTALTIC PUMP

Cornelis J. van Os, Emmen, Netherlands, assignor to Noord-Nederlandsche Machinefabriek B.V., Winschoten, Netherlands

Continuation-in-part of Ser. No. 167,354, Jul. 10, 1980, Pat. No. 4,424,009. This application Jul. 28, 1983, Ser. No. 518,747

Int. Cl.³ F04B *43/10, 43/12*

U.S. Cl. 417—394 **8 Claims**

1. A peristaltic pump comprising:

a pump housing having a supply end and a discharge end;

a pump hose having an outer wall, a supply end, and a discharge end and disposed within said pump housing, said supply and discharge ends of said pump hose being sealingly attached all around to said supply and discharge ends of said pump housing, respectively, said pump hose having a substantially circular cross-section at said supply end and a substantially elliptic cross-section over a portion thereof adjacent said supply end which, starting at said substantially circular cross-section, bcomes gradually flatter and broader to a given minimal value and subsequentially in the direction extending towards said discharge end of said pump hose becomes increasingly less flat and broad until the cross-section of said pump hose again becomes substantially circular, said pump hose having a substantially constant wall thickness along the entire length thereof between said supply end and said discharge end and a substantially constant inner cross-sectional circumference, and said pump hose and said pump housing defining a hollow space therebetween; and

means provided in said pump housing for supplying a pressure medium to said hollow space and for discharging the pressure medium therefrom, whereby pressure is intermittently exerted on the outer wall of said pump hose.

4,515,537

DOSING PUMP

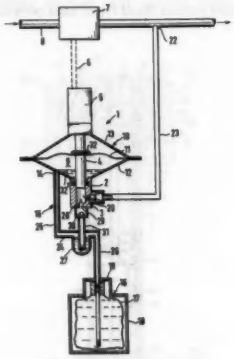
Hans Arens, Wertingen, Fed. Rep. of Germany, assignor to Grunbeck Wasseraufbereitung GmbH, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,394

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134940

Int. Cl.³ F04B *7/04, 23/04*

U.S. Cl. 417—489 **9 Claims**



1. A dosing pump comprising pump cylinder means having a first inlet, a second inlet, and an outlet, a suction valve means and a discharge valve means being provided at the second inlet and the outlet, respectively, dosing piston means cooperating with the pump cylinder means,

diaphragm means connected with the dosing piston means and disposed within a diaphragm chamber and a fluid connection line connecting the diaphragm chamber and an opening thereof with a dosed medium tank,

wherein the diaphragm chamber is disposed at a level above the pump cylinder means and connected with the pump cylinder means via a connection forming the first inlet of the pump cylinder means,

the dosing piston means extending through this connection and allowing fluid to enter the pump cylinder means from the diaphragm chamber when the dosing piston means emerges from the pump cylinder means,

and wherein the second inlet is connected with a suction pipe and the fluid connection line is connected with a pump sump, the suction pipe extending into the pump sump.

4,515,538

CEILING FAN

Hung Y. Shih, Tainan, Taiwan, assignor to DeGeorge Ceiling, Inc., Clearwater, Fla.

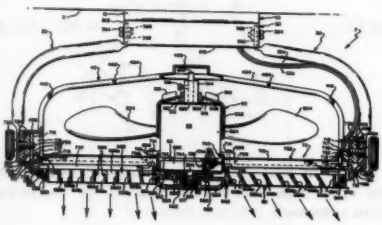
Filed Oct. 7, 1983, Ser. No. 540,176

Int. Cl.³ F04B *21/00*

U.S. Cl. 417—572 **24 Claims**

1. An electric ceiling fan including fan motor means and rotatable fan blade means mounted around and adapted to be driven by said motor means, wherein the improvement comprises: wheel-like frame means mounting said motor means; support means adapted to be attached to the ceiling; hangar arm means connecting said support means and said frame means, said support means comprising a circular base plate for direct attachment to the ceiling and a circular adaptor removably connected to said hangar arm means, said base plate and said adaptor each having upper peripheral walls and said base plate further having a lower end wall extending from said base upper peripheral wall, said lower end wall being reduced for nesting within said adaptor upper peripheral wall, and interengageable means for removably securing said adaptor upper

peripheral wall against said base plate end wall, said interengageable means including diametrically opposite bayonet slots extending through said adaptor upper peripheral wall and upwardly open outstanding struts having threaded openings formed therethrough depending from said base plate end wall whereby said bayonet slots are rotatingly engageable with said struts, and threaded fastener means passing through said adaptor upper peripheral wall and engageable in said strut openings; air pervious upper guard means mounted on said frame means and enclosing said fan blade means and motor means, while permitting air flow to said fan blade means; step motor



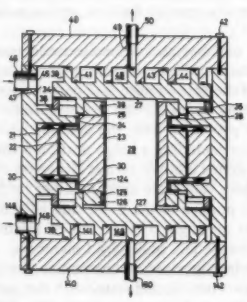
means mounted on said frame means; air pervious lower guard means mounted on and adapted to be driven by said step motor means beneath said frame means and including vane means for controlling air flow direction from said fan blade means; and control means adapted to be connected across a power source and including switch means having electrical connections to said fan motor means and step motor means for energizing and deenergizing the same; said fan having a maximum overall axial depth, from said support means to said lower guard means inclusive, of not more than about 10 inches, for maximizing headroom.

4,515,539

SCROLL-TYPE HYDRAULIC MACHINE WITH TWO AXIALLY SPACED SCROLL MECHANISMS

Etsuo Morishita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,438
Claims priority, application Japan, Sep. 1, 1983, 58-162131
Int. Cl.³ F01C *1/04, 11/00, 17/06*
U.S. Cl. 418—55 **5 Claims**



1. A scroll-type hydraulic machine, comprising:

a first fluid volume changing mechanism comprising a first stationary scroll having a first scroll wrap, and a first orbiting scroll having on one surface thereof a second scroll wrap and on the other surface thereof a first orbiting scroll shaft, said first orbiting scroll being assembled with said first stationary scroll such that, when said second scroll wrap orbits with respect to said first scroll wrap, fluid introduced therebetween is changed in volume and discharged;

a second fluid volume changing mechanism comprising a second stationary scroll having a third scroll wrap, and a second orbiting scroll having on one surface thereof a fourth scroll wrap and on the other surface thereof a second orbiting scroll shaft, said second orbiting scroll being assembled with said second stationary scroll such that, when said fourth scroll wrap orbits with respect to said third scroll wrap, fluid introduced therebetween is changed in volume and discharged;

a crank mechanism comprising a crankshaft having an eccentric through-hole extending therethrough, a first crank portion formed at one end thereof for rotatably supporting said first orbiting scroll shaft, and a second crank portion formed at the other end thereof for rotatably supporting said second orbiting scroll; and

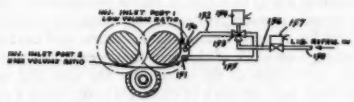
a thrust-cancelling shaft disposed in said eccentric through-hole of said crankshaft for supporting at one end thereof said first orbiting scroll and at the other end thereof said second orbiting scroll, thrust forces exerted on said first and second orbiting scrolls cancelling each other through said thrust-cancelling shaft.

4,515,540

VARIABLE LIQUID REFRIGERANT INJECTION PORT LOCATOR FOR SCREW COMPRESSOR EQUIPPED WITH AUTOMATIC VARIABLE VOLUME RATIO

Joseph W. Pillis, Hagerstown, Md., assignor to Frick Company, Waynesboro, Pa.

Filed Nov. 22, 1983, Ser. No. 554,477
Int. Cl.³ F01C *21/06, 1/16*
U.S. Cl. 418—97 **5 Claims**



1. In a screw compressor having meshing helical rotors on parallel axes and mounted in a housing having intersecting cylindrical bores, whereby the rotors and housing provide an interlobe volume which varies with the rotation of the rotors, said housing having a high pressure end wall at one end of said housing and a low pressure end wall at the other end thereof, the low pressure end wall having an inlet opening for the inlet of the compressor and the high pressure end wall having a discharge opening for the outlet of the compressor, means for varying the internal volume ratio of said compressor, first and second ports in said housing, said ports being located in said housing for exposure to the interlobe volume at selected positions of the rotors, said first port being located so that the interlobe volume is relatively large when the interlobe volume is first exposed to it, and said second port being located so that the interlobe volume is relatively small when the interlobe volume is first exposed to it, whereby the interlobe volume varies when said rotors initially communicate with either of said ports, and means for selectively introducing liquid refrigerant into one or the other of said ports.

4,515,541

DEVICES FOR VULCANIZING TIRES

Bruno Salvadori, Milan, Italy, assignor to Societa Pneumatici Pirelli, Milan, Italy

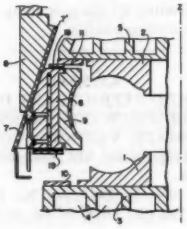
Filed Jan. 11, 1984, Ser. No. 569,916
Claims priority, application Italy, Jan. 12, 1983, 19067 A/83
Int. Cl.³ B29H *5/02*
U.S. Cl. 425—47 **6 Claims**

1. A device for molding and vulcanizing a vehicle tire made of elastomeric material comprising:

two continuous and coaxial annular sections, axially radially

and reciprocally movable, corresponding to tire sidewalls, and

a plurality of sectors, corresponding to a perimeter zone outside of said tire, interposed between said annular sections and axially movable with respect thereto, said sectors being fixed to the radially inner surface of a containing-ring co-axial with said annular sections and axially movable with respect thereto, said sectors being radially shiftable with respect to the axis of said sections and axially shiftable with respect to at least one of said sections, each sector being provided on its radially inner surface with a matrix suited for molding of said outer perimeter zone of said tire, a corresponding portion of the tread design, and being provided on its radially outer surface with surfaces that are inclined with respect to the axis of said ring and coupled with a corresponding portion of the radially inner surface of said containing-ring, with reciprocal sliding means for the realization of said radial shifting of said sectors, said device being characterized by the



fact that said sectors are provided with cavities which constitute a part of a circuit that is permanently closed to the outside ambient, suited for allowing the circulation of a fluid for directly heating said sectors, said cavities constituting a network of channels that present points of entry from the outside of the sector, for the inlet and outlet of said fluid, said network of channels comprising a plurality of axial blind-channels, having their axes parallel to that of the device, connected one to the other by a plurality of transverse blind-channels, each transverse blind-channel connecting at least two axial channels, said network of channels being connected with the radially outer surface of the sector by means of two substantially radial channels, respectively below and above, connected to at least one of said axial channels, the lower radial channel being disposed in correspondence to the axially lower extremity of said axial channels, each of said transverse and radial channels having its axis inclined, with respect to the axis of the corresponding axial channel, at an angle of about 90°.

4,515,542

APPARATUS FOR THE PRODUCTION OF A RECONSTITUTED TOBACCO FOIL

Johann Peschetz, Enzersdorf an der Fischa, Austria, assignor to Austria Tabkwerke Aktiengesellschaft vorm. Osterreischische Tabakregie, Vienna, Austria

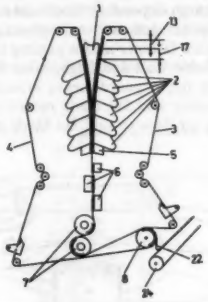
Filed Jul. 3, 1984, Ser. No. 627,658

Claims priority, application European Pat. Off., Jul. 5, 1983, 83106530.5

Int. Cl.³ B28B *1/26*

U.S. Cl. 425—84 **7 Claims**

1. An apparatus for the production of a reconstituted tobacco foil by precipitating from an aqueous suspension films consisting predominantly of tobacco particles, comprising two movable endless screens which approach one another in the film forming region, a wedge-shaped box being arranged between the screens and dehydrating means being provided beneath the screens in said region, wherein the screens subsequently extend parallel to one another and at a spacing small enough to combine the two films to a single foil, characterized in that the upper side of the wedge-shaped box forms a reser-



voir limited by longitudinally extending side-walls with horizontal upper rim, and having conduits for conducting the aqueous suspension into said reservoir.

4,515,543

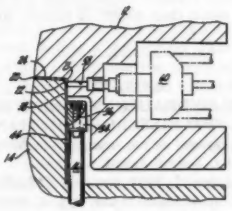
IN-MOLD COATING PART EJECTION SYSTEM

James R. Hamner, Sterling Heights, Mich., assignor to The Budd Co., Troy, Mich.

Filed Sep. 2, 1983, Ser. No. 528,947

Int. Cl.³ B29C *1/00*; B29G *1/00*

U.S. Cl. 425—112 **10 Claims**



1. Apparatus for compression molding parts so as to provide them with extremely smooth finishes, said apparatus comprising:

a male mold member and a female mold member having complimentary surfaces defining a cavity approximating the shape of the desired part, said part being characterized by an enlarged generally flat major surface which is desired to be provided with the smooth finish, said male mold member including a ledge portion formed in at least one side to define a down turned flange on outer extremities of the part, said male mold member further including an undercut portion in the mold side adjacent said ledge extending at an angle to the path of relative travel between the female and male mold members;

means for moving the mold members to a closed position for curing the part into a solid state, with the part including a lip on the flange due to the provision of the undercut portion in the male mold member;

means for separating the mold members to a partially opened condition, with said lip of the flange serving to retain the part onto the male mold;

injector means for injecting a coating material onto the top surface of the part;

means for subsequently moving the mold members back to said closed position to cure the coating material;

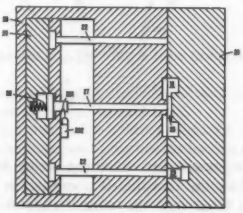
means for opening the mold members; and

ejection means for pressing upwardly on the down turned flange to lift the part from the male mold in such manner so as to not destroy the smooth finish on the coated major surface of the part.

4,515,544
MOLD PROTECTION DEVICE

Russell W. Boehm, Longmont, Colo.; Robert P. Rippstein, Hopewell Junction, N.Y., and David R. Stone, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,666
Int. Cl.³ B29F 1/00
U.S. Cl. 425—129 R **6 Claims**



1. In an injection molding apparatus having first and second mold cavity-forming elements movable between open and closed positions and insert means placed into the mold cavity of said first element when said elements are in the open position, the improvement comprising:

plunger means mounted within said second cavity-forming element;

resilient biasing means for retaining said plunger means in an orientation for engaging said insert in said first element before closure is completed by said elements;

means for detecting movement of said plunger means as said elements close; and

means responsive to said detecting means for indicating whether movement of said plunger means exceeded a predetermined value before said elements reached the closed position.

3. A system for indicating incorrectly placed inserts in a molding apparatus, the molding apparatus having two or more mold elements which close to form a closed cavity and inserts placed within said cavities, comprising, in combination:

means for supplying a closure command signal;

movement detector means for supplying a first signal indicating that an insert has been detected;

closure detector means for supplying a second signal for indicating that the mold elements have closed;

sequence detector means for supplying a correct sequence signal when said second signal occurs before said first signal; and

gate means responsive to said closure command signal and to said correct sequence signal for supplying a signal to cause said elements to close.

4,515,545
CONTROL SYSTEM FOR PROCESSING COMPOSITE MATERIAL

Richard J. Hinrichs, Cerritos, and Judy Thuen, Capistrano Beach, both of Calif., assignors to Applied Polymer Technology, Inc., Carlsbad, Calif.

Division of Ser. No. 281,877, Jul. 9, 1981, Pat. No. 4,455,268. This application Jun. 15, 1984, Ser. No. 620,861
Int. Cl.³ B29G 7/00
U.S. Cl. 425—143 **10 Claims**

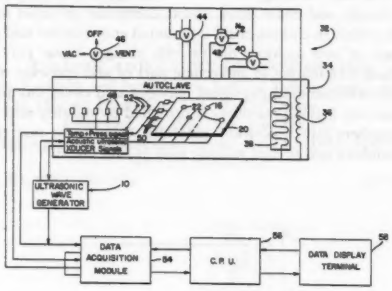
1. A system for controlling the curing process of a structure formed of fiber-reinforced resin composite materials and the like, wherein said structure is cured in an autoclave having temperature and pressure regulating means, said system comprising:

first temperature sensitive means proximate the surface of said structure for producing a first temperature indicative signal;

second temperature sensitive means in said autoclave for producing a second temperature indicative signal;

pressure sensitive means in said autoclave for producing a pressure indicative signal;

data processing means, receptive to said first and second temperature indicative signals and to said pressure indica-



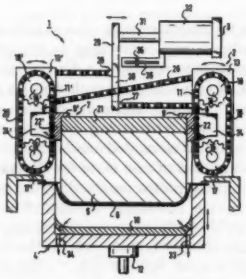
tive signal, for (a) comparing said first and second temperature indicative signal to a first preselected temperature datum, (b) comparing said second temperature indicative signal to a second preselected temperature datum, (c) comparing said pressure indicative signal to a preselected pressure datum, and (d) producing at least one output signal indicative of the result of each of said comparisons, and

control means receptive to said output signals for controlling said temperature and pressure regulating means in accordance with the results of said comparisons.

4,515,546
MOLDING APPARATUS PROVIDED WITH SEPARABLE MOLD PARTS

Emmerich Medwed, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller, KG, Fed. Rep. of Germany

Continuation of Ser. No. 242,355, Mar. 10, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 498,391
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 8007087[U]
Int. Cl.³ B29C 1/16, 3/00
U.S. Cl. 425—195 **7 Claims**



1. A molding die for shaping thermoplastic sheet material

and means for reciprocating said molding die along a moving path comprising first engagement means provided laterally on said molding die and cooperating second engagement means provided laterally of said moving path and opposite said first engagement means, said second engagement means comprising chain drive means and said first engagement means comprising drive members formed with teeth to mesh with the link members of said chain drive means when in position laterally adjacent thereto, said moving die being movable into a retracted position at one end of said moving path in which said first and second engagement means are disengageable, whereas said first and second engagement means are in driving engagement when said molding die is moved along said moving path and wherein said chain drive means comprises sprocket members on which an endless chain is mounted and wherein said moving path of said molding die extends along a linear part of said chain terminating in an arcuate part of said sprocket member, and wherein disengagement between said chain link members and said driving members is provided by moving said driving members into a position generally opposite to said sprocket members and to said arcuate part of said chain.

4,515,547

APPARATUS FOR THE MANUFACTURE OF CONICAL HOLLOW POLES OF FIBER REINFORCED SYNTHETIC RESIN

Brüno Rother, Neumarkt, and Hartmut Trommen, Postbauer-Heng, both of Fed. Rep. of Germany, assignors to G.A. Pfleiderer GmbH & Co. KG, Neumarkt, Fed. Rep. of Germany

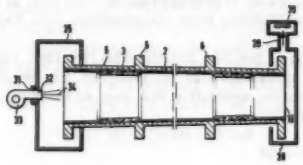
Filed Feb. 2, 1983, Ser. No. 463,084

Claims priority, application European Pat. Off., Dec. 30, 1982, 82112108.4

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ B29C *5/04*

U.S. Cl. 425—215 **10 Claims**



1. Apparatus for manufacturing conical hollow poles of fiber reinforced synthetic resin comprising an elongated mold having an interior surface receiving a fiber reinforcement, said interior surface of said elongated mold being a generally conical surface, injection nozzle means disposed at one longitudinal end of said mold for introducing synthetic resin generally longitudinally into said elongated mold, a light source disposed at one longitudinal end of said mold for illuminating the interior of said mold, ring means mounted on the longitudinal end of said mold having the larger interior diameter, said ring means having an inner diameter corresponding to the interior diameter of said conical hollow pole at the larger diameter bottom of said conical hollow pole, whereby excess resin passes out of said elongated mold past said ring means, and a first housing disposed about the longitudinal end of said mold and said ring means for receiving said excess synthetic resin.

4,515,548

APPARATUS FOR FORMING AND CUTTING LATEX BLOCKS INTO STRIPS

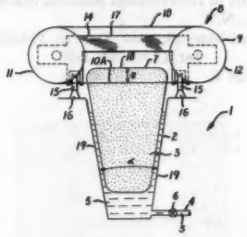
Robert Mioche, Durtol, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Mar. 10, 1983, Ser. No. 474,124

Claims priority, application France, Apr. 7, 1982, 82 06226

Int. Cl.³ B29H *3/06*

U.S. Cl. 425—308 **15 Claims**



1. An arrangement for obtaining strips from a material, characterized by the fact that it comprises a tank, means for introducing a latex into the tank, means for introducing a coagulating agent into the latex to coagulate the latex and form a block of latex coagulum, means for introducing a fluid into the tank to cause the block to float in the fluid, and means for cutting the block into strips from an emergent portion of the floating block.

4,515,549

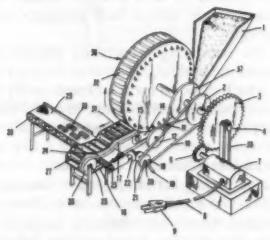
HIGH SPEED AUTOMATIC BRICK MAKING MACHINE

Der C. Yang, 298 Chung Hwa Rd., Ta Yuan, Tao Yuan, Taiwan

Filed Nov. 18, 1980, Ser. No. 207,919

Int. Cl.³ B28B *3/12, 5/02*

U.S. Cl. 425—350 **1 Claim**



1. A high speed automatic brick making machine comprising:

(a) a pressure wheel having at its circumference brick pressing tongues said tongues being free to rotate and each being attached to said wheel by means of an axle passing through the tongue, the ends of the axle being fixed to the circumference of the pressure wheel;

(b) a plurality of moulds disposed on an endless belt, said moulds having a pair of side-walls and a pair of expandable end walls, said moulds corresponding to said press tongues the press tongues reducing the height of the material in the moulds by about one half, the railing for the endless belt having an expanded portion whereat the end walls expand to release the compressed brick contained within the mould after compression;

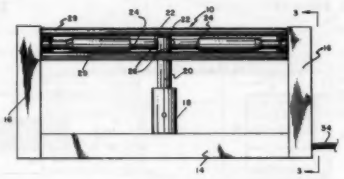
(c) a hopper for feeding clay to the moulds; and

(d) driving means for said pressure wheel and endless belt.

4,515,550
TUBE CRIMPING DEVICE

Lowell A. Miller, Denver, Colo., assignor to Scientific Laboratories, Inc., Denver, Colo.

Filed Mar. 9, 1984, Ser. No. 587,949
Int. Cl.³ B29C *17/02*
U.S. Cl. 425—392 9 Claims

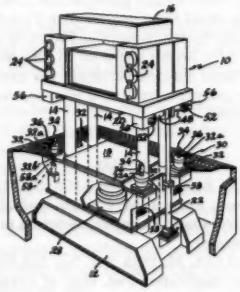


1. An apparatus for forming a tube comprising
a base;
a pair of legs secured to the ends of said base;
a holder base attached to said base;
a tube holder means for holding said tube and connected to said holder base, said tube holder having a structure defining a pair of diametrically opposed openings;
a pair of soldering irons means oppositely secured with respect to each other in proximity to the top of said pair of legs, each soldering iron means having a hot end that generally registers with one of the opposed openings such as to be in close proximity to the tube being held by the tube holder means in order to soften the material of the tube in the area contiguous to the openings;
power means for conducting and supplying electrical power to each of the soldering irons means;
vacuum means connected to the top of the tube to suck or pull inward the tube in the spots being softened from the heat of the pair of soldering irons means;
means for cooling the material of the tube in the spots being softened and simultaneously for ceasing the inward movement of the softened spots.

4,515,551
CLOSED LOOP HYDRAULIC/MECHANICAL LEVELING SYSTEM

Myron I. Korytko, Erie, Pa., assignor to EFCO, Inc., Erie, Pa.

Filed Jul. 11, 1984, Ser. No. 629,608
Int. Cl.³ B30B *15/16*; B29C *3/00*
U.S. Cl. 425—406 17 Claims

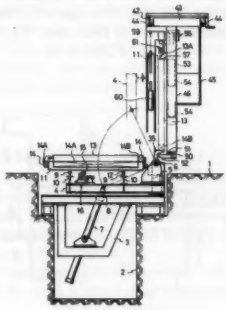


1. In a fluid powered press, a first platen, a second platen, at least one of said platens being reciprocably movable along a predetermined axis relative to the other platen, motor means for so moving said movable platen, a plurality of leveling hydraulic piston and cylinder units, each of said leveling units including a projecting rod member connected to the piston of the respective leveling unit and movable with the piston thereof axially relative to the cylinder of the respective leveling unit, said leveling units being mounted on one of said platens, and means for selectively coupling said rod members to the other of said platens, means coacting with said leveling units in said press for maintaining said leveling unit cylinders filled with hydraulic fluid, conduit means providing hydraulic fluid communication between said leveling units, and means coacting with said maintaining means in and means said press for isolating said maintaining means from said leveling unit cylinders whereby said leveling units and said conduit means are maintained as a closed loop system for preventing tilting movement of said platens relative to one another during said relative axial movement.

4,515,552
RELEASE AND CARRY-OUT APPARATUS

Takao Kataishi, and Iwazou Seo, both of Tokyo, Japan, assignors to Misawa Home Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,132
Claims priority, application Japan, Apr. 17, 1981, 56-57941
Int. Cl.³ B28B *7/08*
U.S. Cl. 425—436 RM 9 Claims



1. An apparatus for releasing a molded article from a mold and transporting the molded article to another location, comprising:
a base;
a mold including a mold bed and a plurality of frame members disposed thereon and defining the perimeter of a mold cavity, said mold bed having a plurality of wheels mounted on the bottom thereof;
means for transporting said mold in a substantially horizontal position after forming a molded article in the mold cavity, the molded article having lifting hooks projecting from one edge thereof;
an erectable frame, horizontal pivot means at one end portion of said frame, said pivot means mounting said frame on said base for pivotal movement with respect to said base between a substantially horizontal position and an upright position, said mold transporting means comprising a pair of rails formed on the upper side of said erectable frame in alignment with said wheels whereby said mold can be moved along said rails until said mold bed is in position to be secured to said erectable frame, said mold transporting means being adapted to bring said mold onto said erectable frame in a substantially horizontal position;
means for moving said erectable frame between said horizontal and upright positions;
means for releasably securing said mold bed to said erectable frame so that said mold bed carrying a molded article thereon can be transported onto said erectable frame when said frame is in its horizontal position, then secured to said erectable frame, and then moved to an upright position with said erectable frame, said one edge of the

molded article being the upper edge when the molded article is in the upright position so that said lifting hooks project upwardly;

a receiving mechanism adapted to receive and support the molded article in the upright position thereof when said mold bed is removed from the molded article and said erectable frame is moved from the upright position to the substantially horizontal position;

a clamp mechanism for clamping said lifting hooks to releasably secure the upper edge of the molded article when it is supported upright on said receiving mechanism;

a support frame provided above said clamp mechanism; and

a carrier movably mounted on said support frame adapted to support and maintain the molded article in an upright position when the molded article is released from said receiving mechanism and said clamp mechanism, and to transport the molded article along said support frame.

4,515,553

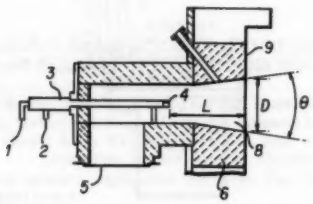
COMBUSTION METHOD FOR REDUCING THE EMISSION OF NITROGEN OXIDES

Kotaro Morimoto, and Tomio Suzuki, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 138,757, Apr. 10, 1980, abandoned. This application Dec. 1, 1982, Ser. No. 446,037

Int. Cl.³ F23C *5/00*

U.S. Cl. 431—8 **3 Claims**



1. A combustion method for reducing emission of oxides of nitrogen in an industrial furnace comprising a combustion chamber, a fuel supply, a burner for burning said fuel with a combustion air, and a port block, wherein said burner further comprises a burner tip, wherein said port block further comprises an inner furnace end surface exposed to said combustion chamber and a bore formed within said port block, wherein said bore includes a conical injection opening defining a spread angle, wherein said method comprises:

introducing said combustion air into said bore coaxially around said burner such that the total combustion air flow into said bore is symmetric about a first axis;

injecting said fuel through said burner tip into said bore such that the total fuel flow into said bore is symmetric about a second axis;

mixing said combustion air and said fuel within said bore;

directing said air and said fuel into said furnace in a substantially diverging conical pattern included within said spread angle;

maintaining said spread angle below 45° such that said air and said fuel form a diverging flow pattern;

maintaining the distance of said burner tip from said inner furnace end surface at less than 1.3 times the diameter of said bore measured at said inner furnace end surface; and

maintaining said total fuel flow through said burner tip such that said second axis of said total fuel flow forms an angle between 5° and 45° with respect to said first axis of said total flow of said combustion air, whereby said burning of said fuel is delayed so as to reduce said emission of oxides of nitrogen.

4,515,554

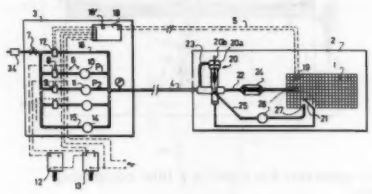
IGNITION AND FUEL SUPPLY SYSTEM FOR A GAS-FUELED HEAT-RADIATOR

Joseph Sirand, Laplume, France, assignor to S.A.R.L Centre d'Etude et de Realisation d'Equipment et de Materiel C.E.R.E.M., Laplume, France

Filed Jan. 5, 1983, Ser. No. 454,004

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—78 **13 Claims**



1. A supply and ignition system for gas-fueled heater-radiators comprising upstream feed means for connection to a source of gas and for supplying the gas within a pressure range Pi corresponding to the heating mode requirements of said heat radiator, said upstream feed means comprising at least two parallel branch lines each provided with a controlled valve and with a gas-expanding device, the expanding devices of different branch lines being at different discharge pressures within said range Pi, and said controlled valves being controlled by thermostatic means for assuring heating modes as a function of sensed temperature, said controlled valves comprising electric valves, and one of said electric valves being normally open in the absence of energization so as to enable the supply of gas in the event of power failure, a gas burning heat-radiator remote from said feed means, a safety valve in proximity to said heat-radiator and having a gas discharge conduit connected to said heat radiator by a gas injection conduit, temperature sensing means for controlling the opening of said safety valve, pilot means mounted on said heat radiator for ignition thereof and operatively connected to said temperature sensing means whereby said safety valve is maintained in the open position when said pilot means is lit, a pilot flame conduit in parallel with said gas injection conduit for connecting said safety valve with said pilot means, means for conveying gas from said feed means to said safety valve, upstream gas expanding means connected in parallel with said feed means for continuously supplying gas to said conveying means at a pressure pv less than the presures Pi of the heating modes, a gas pressure responsive selector valve in said gas injection conduit adapted to open at pressures equal to or greater than Pi and thereby permit gas flow to said heater-radiator and to close at the pressure pv and thereby only permit gas flow to said pilot flame conduit, said pilot flame conduit including gas expanding means for reducing the gas pressure at said pilot means to a substantially constant value.

4,515,555

VAPOR BURNER FOR LIQUID FUEL

Jorgen H. Petersen; Peter J. M. Clausen, and Hilmar O. Rasmussen, all of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Oct. 26, 1983, Ser. No. 545,528

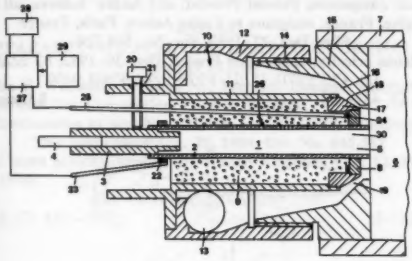
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243396

Int. Cl.³ F23D *11/44*

U.S. Cl. 431—208 **31 Claims**

1. A vapor burner for a liquid fuel, comprising, an elongated fuel gasifying chamber, a combustion chamber connected to said gasifying chamber, said fuel gasifying chamber having an inlet for liquid fuel and an outlet through which ignited gasified fuel is fed to said combustion chamber, said

fuel gasifying chamber being formed so that no forced air is admissible thereto through said inlet end thereof, electrical heating means for heating said gasifying chamber to a gasifying temperature, air passage system means for supplying air of



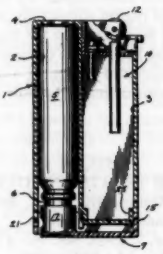
combustion to said combustion chamber, heating means surrounding the outlet end of said fuel gasifying chamber to form a glow zone heatable to the fuel mixture ignition temperature by said heating means.

4,515,556

COMBINED LIGHTER AND MOUTH SPRAY

Johnny Vanelli, La Guna Nigel, Calif., assignor to Optimum Manufacturing Inc., Denver, Colo.

Filed Jul. 28, 1983, Ser. No. 517,471
Int. Cl.³ F23Q *1/02*
U.S. Cl. 431—253 **5 Claims**



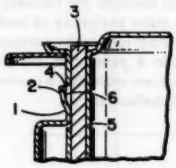
1. A combined lighter and breath spray which comprises:
an elongated case which defines a pair of side-by-side chambers that extend along substantially the entire length of the case;
a lighter attached to the case and disposed in one of the chambers with its operating end extending from one end of the case; and
a breath spray unit disposed in the other chamber and having an operating end which extends from the other end of the case, said breath spray unit including a container which may be removed from the case and replaced by another similar container, in which the container is retained in said other chamber by an actuator cap attached to said other end of the case, and
in which the container includes a valve having a valve stem which extends along an operating axis toward said other end of the case, and the actuator cap includes a valve actuator which engages the valve stem and which may be depressed by a user to operate the valve in the breath spray unit and convey the atomized fluid emitted from the stem through an opening in the valve actuator.

4,515,557

KEROSENE COMBUSTION APPARATUS

Hideo Nishikawa; Kenzo Okamoto; Koichi Sakai, and Fumihiko Kitada, all of Osaka, Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co.), Osaka, Japan

Filed Jan. 19, 1984, Ser. No. 572,192
Int. Cl.³ F23D *3/02*
U.S. Cl. 431—302 **9 Claims**



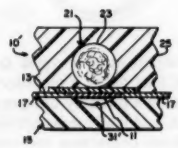
1. Kerosene combustion apparatus of a type in which ignition, extinction and control of caloric power are effected by vertically moving a wick material comprising:
inner and outer cylinders coaxially disposed relative to one another and defining a gap therebetween; a wick material disposed within the gap between the cylinders, the outer cylinder being provided in the vicinity of its upper end with outwardly strip-shaped projections extending circumferentially, each having a slit.

4,515,558

ENCAPSULATED PHOTOFLASH DEVICE HAVING A RADIANT ENERGY-ACTIVATED DISCONNECT SWITCH AS PART OF THE CIRCUITRY THEREOF

Harold H. Hall, Jr., Marblehead, and Andre C. Bouchard, Peabody, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 6, 1982, Ser. No. 337,354
The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—359 **9 Claims**



1. A photoflash device comprising:
a substrate member including at least one depression therein;
lamp-firing circuitry located on a first surface of said substrate member;
at least one radiant energy-activated disconnect switch located on said first surface of said substrate member and electrically connected to said lamp-firing circuitry;
a thin, light-transmitting member positioned on said disconnect switch and secured to said first surface of said substrate member substantially about said disconnect switch to provide a protective cover for said switch in such a manner that said switch is able to move independently of said thin, light-transmitting member;
at least one photoflash lamp positioned on said substrate member and including a glass envelope located in contact with an upper surface of said thin, light-transmiting member and adjacent said disconnect switch, said light-transmitting member thereby providing a predetermined spac-

ing between said lamp and said disconnect switch, said photoflash lamp adapted for activating said switch through said light-transmitting member upon ignition thereof, said disconnect switch located between said photoflash lamp and said depression and bridging said depression; and

a quantity of light-transmitting, solid polymer material located in contact with said substrate member and said thin, light-transmitting member and further contacting substantially the entire outer periphery of said glass envelope of said photoflash lamp to thereby surround said glass envelope and provide a protective covering therefor, said photoflash device not including a curved reflector located adjacent said photoflash lamp.

4,515,559

HEAT TREATMENT METHOD AND APPARATUS

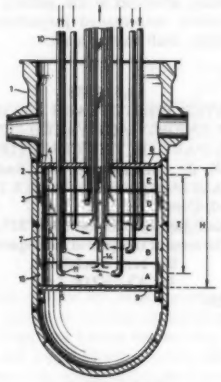
Gary F. Parker, Southport, England, assignor to Cooperheat, Merseyside, England

Filed Aug. 5, 1983, Ser. No. 520,811

Claims priority, application United Kingdom, Dec. 16, 1982, 8235905

Int. Cl.³ F27D *5/00*; F24J *3/00*; F24H *3/00*

U.S. Cl. 432—10 **16 Claims**



1. Apparatus for heat treating a vessel, the apparatus comprising a plurality of inlet ducts; a plurality of exhaust ducts; and wall means defining a plurality of compartments for containing a heated fluid, said wall means preventing heated fluid in a compartment from contacting the vessel; each of said compartments having an exterior wall portion and being provided with at least one of said inlet ducts and at least one of said exhaust ducts for supplying and removing the heated fluid to and from the interior of the compartment, and said wall means being such that the exterior wall portion of each of said compartments is adjacent the exterior wall portion of at least one other one of said compartments whereby the wall portions form respective parts of a radiating surface for radiating heat onto a confronting interior wall or wall portion of the vessel; the apparatus further including means for supplying heated fluid to each of said inlet ducts and for controlling the thermal input of the heated fluid supplied to the respective inlet ducts, each of said compartments being independent of the other so that their internal temperatures may be individually controlled by controlling the thermal inputs of the heated fluid supplied to the respective inlet ducts, said means for supplying heated fluid and for controlling the thermal input of the heated fluid being operable to maintain a predetermined temperature profile across said radiating surface during the heat treatment process.

4,515,560

GRILL ELEMENT OF CAST METAL FOR SOLID-FLUID HEAT EXCHANGE AT VERY HIGH TEMPERATURE COMPRISING A LATCHING DEVICE WHICH IS INTEGRATED IN THE GRILL STRUCTURE

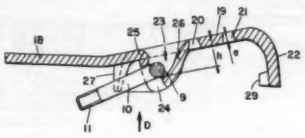
Claude Jacquemin; Florent Provost, and André Seinera, all of Ugine, France, assignors to Ugine Aciers, Paris, France

Filed Dec. 27, 1983, Ser. No. 565,724

Claims priority, application France, Dec. 30, 1982, 82 22236

Int. Cl.³ F27D *15/02*; F27B *9/14*; F26B *9/00*

U.S. Cl. 432—80 **8 Claims**



1. A fixed or movable grill element for heat exchange between a divided solid at very high temperature and a fluid at lower temperature which grill element is adapted to be at least releasably fixed to a support by a connecting member including a head and a leg attached thereto, comprising a plate of cast refractory steel having upper and lower faces, said upper face receiving the grains or particles of the solid which are displaced along said upper face, said plate comprising an array of through perforations defining holes through which the fluid passes in an upward direction, the upper face of the plate comprising at least one recessed region in which a portion of said upper face is at a depth relative to the remainder of said upper face, which depth is greater than the height of the connecting member that it contains, and wherein said portion of said upper face at the region of greatest depth is below said lower face in the region surrounding the recessed region, the bottom of this recessed region comprising at least one through perforation defining a hole in which the leg of the connecting member is engaged, the head of the connecting member being retained within said recessed region in a position of bearing against the edge portions defining the hole in which the leg is engaged.

4,515,561

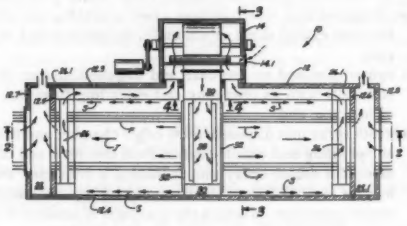
FIBER TREATMENT OVEN

Hans L. Melgaard, Minneapolis, Minn., assignor to Despatch Industries, Inc., Minneapolis, Minn.

Filed Mar. 7, 1983, Ser. No. 473,076

Int. Cl.³ F27B *9/00*

U.S. Cl. 432—136 **15 Claims**



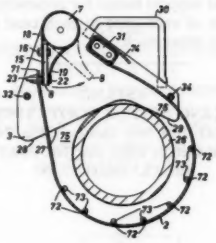
1. A fiber-treatment oven for heating fibers by contact thereof with hot gas and comprising housing means defining a plurality of spaced, parallel pathways for a plurality of fibers to traverse the interior of the housing in the direction of and along said pathways, and means providing a source of hot gas; the oven being characterized by including hot gas emission means carried within the housing and oriented to provide a plurality of parallel streams of hot gas parallel to and between

said fiber pathways longitudinally of the direction of fiber travel to gently contact said fibers; and hot gas exhaust means spaced from the emission means and oriented to receive hot gases emitted parallel to and between the fiber pathways.

4,515,562
APPARATUS FOR APPLYING HEAT TO A PORTION OF A PIPELINE

John P. Williams, Williton, Nr. Taunton, England, assignor to British Gas Corporation, London, England

Continuation of Ser. No. 433,645, Oct. 12, 1982, abandoned.
This application Aug. 29, 1984, Ser. No. 645,341
Claims priority, application United Kingdom, Oct. 12, 1981, 8130701
Int. Cl.³ F28F 7/00; F24J 3/00
U.S. Cl. 432—225 **15 Claims**



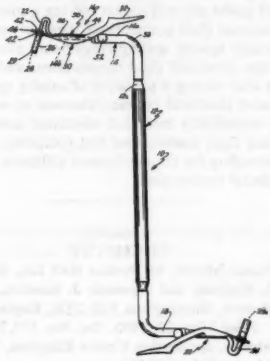
1. Apparatus for applying heat to a portion of a pipeline, the apparatus comprising an elongate manifold for mounting on the pipeline, the manifold having an inlet for receiving hot gas and an outlet for discharging the gas along the portion of the pipeline to be heated, means for releasably mounting the manifold on the portion of the pipeline to be heated and a flexible blanket of heat insulated material which is wrappable around the portion of the pipeline to be heated at a spacing therefrom so that a heat shroud encircling at least a major part of the pipeline circumference is formed between the blanket and the adjacent surface of the pipeline, the opposite ends of the blanket being attachable respectively to the manifold and the manifold mounting means in such a manner that the heat shroud has at the manifold end an opening for receiving hot gas from the manifold and at the manifold mounting means end an opening for discharging the gas after circulation around the surface of the pipeline, and one of said ends of said blanket being releasably attachable so as to permit the blanket to be readily wrapped around and unwrapped from the pipeline, wherein those edges of the blanket forming the edges of the heat shroud are gathered so that their length is reduced in comparison to the actual length of the blanket to enable the edges to grip the walls of said pipeline.

4,515,563
AMALGAM CARRIER

Kenneth F. Dungill, 2049 Hall St., SE., East Grand Rapids, Mich. 49506

Filed Feb. 23, 1983, Ser. No. 468,884
Int. Cl.³ A61C 5/04
U.S. Cl. 433—90 **10 Claims**

1. An amalgam carrier comprising:
an elongated generally linear handle;
a support portion extending generally perpendicularly from said handle and terminating in a plunger end, said handle and said support portion connected so as to define an elbow; and
an amalgam release mechanism supported on said support portion, said release mechanism defining an amalgam bore located at said plunger end, said bore opening away from said support portion in a direction generally common and parallel with said handle whereby said bore can be aligned with a cavity in a distal or lingual tooth surface, said release mechanism including a plunger slidably received within said bore to expel amalgam therefrom and lever means for shifting one of said bore and said plunger relative one another, said lever means including an actuating

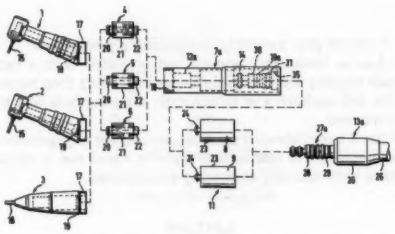


member generally parallel to said support portion and reciprocable in a direction generally axially aligned with said handle, said actuating member including an actuated position substantially adjacent said elbow wherein said plunger protrudes from said bore to expel amalgam therefrom.

4,515,564
DENTAL HANDPIECE

Gerd Löhn, Biberach, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,218
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215207
Int. Cl.³ A61C 1/08
U.S. Cl. 433—126 **26 Claims**



1. A dental handpiece comprising a universal holder sleeve member providing for the universal mounting therein of different types of motor units and drive trains, means provided at one end of the sleeve member to mount a dental implement, an interchangeable motor unit, interchangeable between electric motor units and pneumatic motor units, arranged in the sleeve member, a power supply member releasably coupled to an opposite end of the sleeve member and arranged to provide power to operate the selected motor unit, an interchangeable drive train, interchangeable between different gearing ratios, extending within the sleeve member from the motor unit to said one end of the sleeve member to enable the motor unit to operate the dental implement when the latter is mounted in the handpiece, at least one supply line extending within the sleeve member and arranged to supply a fluid medium to a treatment

region adjacent to the dental implement, a socket provided in one of said members, a generally cylindrical guide pin provided on the other of said members to be received by the socket in a freely rotatable manner when the members are coupled together, and a power supply line extending from the power supply member to the motor unit via said pin and said socket, said guide pin and socket having a plurality of axially spaced rotational fluid connections therebetween, with a plurality of axially spaced sealing rings being provided for fluid sealing of the rotational fluid connections, and said guide pin and socket also having a plurality of axially spaced slip rings and associated electrical contacts thereon to also provide for rotational, electrically insulated electrical connections, with the rotational fluid connections and rotational electrical connections providing for connections to different types of motor units and dental implements.

4,515,565
DENTISTRY

Peter H. Winter-Moore, 43 Dunton Hall Rd., Shirley, Solihull B90 2RA, England, and Fernando J. Sanchez, 52 Wellington Rd., Edgbaston, Birmingham B15 2ER, England

Filed Mar. 22, 1983, Ser. No. 477,766
Claims priority, application United Kingdom, Mar. 24, 1982, 8208575; Feb. 4, 1983, 8303200
Int. Cl.³ A61C *5/08*
U.S. Cl. 433—221 **4 Claims**

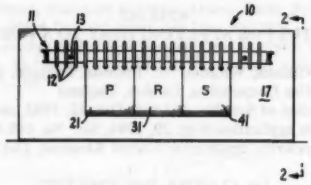
1. A dental post assembly comprising a post which
(a) has its lower end tapered and provided with a barbed self-tapping screwthread having its trailing face reentrant for self-anchoring in an inwardly-tapering hole in a tooth root, and
(b) has a bush threaded on its upper end for engagement in a counterbore in said hole to serve as a lock nut in cooperation with said self-anchoring screwthread.

4,515,566
FLIP CARD APPARATUS FOR FORMING UNITS OF SPEECH

Robert S. Sprague, 448 La Prenda Rd., Los Altos, Calif. 94022

Filed Oct. 27, 1983, Ser. No. 546,030
Int. Cl.³ G09B *1/12, 17/00*
U.S. Cl. 434—172 **28 Claims**

1. A flip card apparatus for forming units of speech comprising in combination:
a ring binder means having equally spaced rings;
a plurality of card decks, each card of which is punched with a plurality of equally spaced holes inwardly of one card edge for attachment to said ring binder, each card of each deck having indicia for cooperation with indicia of the cards of the other card decks fo form a unit of speech, said holes in each of said cards spaced such that the number of complete holes is one less than the width of the card divided by the hole spacing, said indicia located on said cards substantially centered between a pair of said holes; and
support means connected to said ring binder for holding the cards of said decks in side-by-side relation whereby the

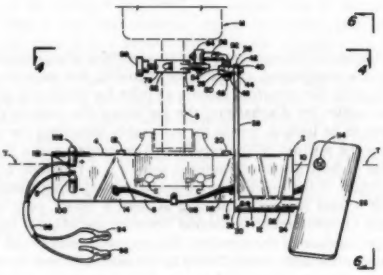


cards of each deck can be flipped over on said binder means on said support means for presenting a combination of the indicia of each card in each card deck with each card in every other deck.

4,515,567
TROLLING MOTOR FOOT CONTROL

Jay R. Wilson, P.O. Box 506, Dewey, Okla. 74029

Filed Oct. 5, 1983, Ser. No. 539,118
Int. Cl.³ B63H *25/00*
U.S. Cl. 440—7 **3 Claims**



1. Steering and operating control means for a water craft provided with a trolling motor having a rotatable support shaft, the control means comprising frame means secured to the water craft, foot pedal means pivotally secured to the frame means, linkage means operably connected between the foot pedal means and the support shaft whereby pivoting of the foot pedal means in one direction rotates the support shaft in one direction for turning of the trolling motor in one direction and pivoting of the pedal means in another direction rotates the support shaft in another direction for turning of the trolling motor in another direction to effect the steering of the water craft, power means operably connected between the foot pedal means and the trolling motor whereby activation of the trolling motor may be selectively controlled by the foot pedal means, the power means comprising electrical terminal means operably connected with a power source, switch means secured to the foot pedal means and electrically connected with the electrical terminal means whereby depression of the switch means activates the trolling motor and release of the switch means deactivates the trolling motor, and wherein the linkage means comprises first substantially horizontally disposed pivotal shaft means secured to the foot pedal means, substantially vertically disposed arm means having one end pivotally secured to the first pivot shaft means for angular orientation thereof upon pivoting of the foot pedal means, second substantially horizontally disposed pivot shaft means operably secured at the opposite end of the arm means and between the arm means and the support shaft whereby angular orientation of the

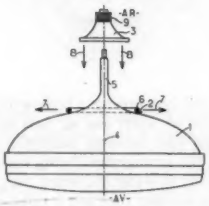
arm means in one direction rotates the support shaft in one direction and angular orientation of the arm means in another direction rotates the support shaft in another direction, and yieldable means secured between the second pivot shaft means and the arm means for substantially continuously urging the arm means toward a normal neutral position therefor to provide a normal forward movement of the water craft, the rotation of the support shaft in said one direction moving the trolling motor for causing a left hand direction of movement for the water craft and the rotation of the support shaft in said another direction moving the trolling motor to cause a right hand direction of movement for the water craft.

4,515,568

PROCESS OF FIXING A DEFLECTION YOKE ONTO THE NECK OF A CRT

Ignazio Cormio, Montrouge, France, assignor to Videocolor S.A., Montrouge, France

Filed Jul. 8, 1982, Ser. No. 396,330
Claims priority, application France, Jul. 9, 1981, 81 13472
Int. Cl.³ H01J *9/236*
U.S. Cl. 445—3 **1 Claim**



1. A method for fixing a deflection yoke on the neck of a cathode tube, comprising the successive steps of:
positioning a stressed elastic abutment on said tube;
positioning said deflection yoke on said neck of said tube;
adjusting the position of said yoke for maximum performance;
fixing a fixed and adjustable abutment on said neck and pressed against one end of said yoke; and
permitting said elastic abutment to elastically relax and press against a second end of said yoke, whereby said yoke is pressed between said fixed and elastic abutments and is held in said adjusted position.

4,515,569

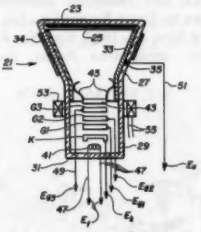
METHOD OF ELECTRICALLY PROCESSING A CRT MOUNT ASSEMBLY TO REDUCE ARCING AND AFTERGLOW

Karl G. Hernqvist, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 22, 1983, Ser. No. 487,462
Int. Cl.³ H01J *9/20*
U.S. Cl. 445—5 **7 Claims**

1. In a method of electrically processing a completed CRT having an electron gun including a focus electrode and a high-voltage electrode, said high-voltage electrode being closely spaced from said focus electrode, the steps comprising

(A) heating portions of said focus electrode that face said high-voltage electrode at temperatures above about 700°



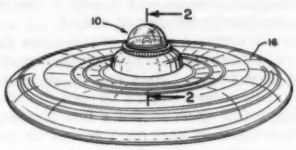
C. and simultaneously (B) spot-knocking said heated portions of said focus electrode.

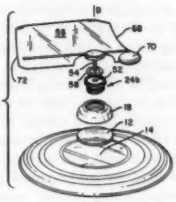
4,515,570

ACCESSORY KIT FOR FLYING DISC TOY

Edward R. Beltran, 15 A. N. San Marcos Rd., Santa Barbara, Calif. 93111

Filed Dec. 29, 1983, Ser. No. 566,693
Int. Cl.³ A63H *27/00*
U.S. Cl. 446—47 **9 Claims**



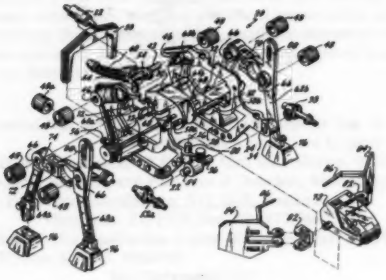


1. A kit for use with a flying disc toy comprising:
a flying disc;
a housing secured to the upper central portion of the flying disc with connector means, said housing including an opening in its top portion;
a plug means engaging said opening having a central aperture through which extends a pivot pin; and,
a rotatable aerodynamic fin member attached to said pivot pin being vertically disposed relative to the disc surface, said fin member including a leading edge and a trailing end with said leading edge having a counterbalance weight means, said pivot pin being connected to the fin member between the mid-point of said member and said leading edge.

4,515,571
MOVING TOY CAPABLE OF BEING NON-PERMANENTLY ASSEMBLED

Michihiro Kozuka, and Masayuki Tonokura, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Japan

Filed Nov. 22, 1982, Ser. No. 443,432
Claims priority, application Japan, Nov. 24, 1981, 56-174363[U]
Int. Cl.³ A63H *33/04*
U.S. Cl. 446—90 7 Claims



1. A toy which comprises:

a body, said body having a first and a second body section, each of said first and said second body sections including a mating face, each of said mating faces complementary to the other of said mating faces such that said first and said second sections can be positioned in association with one another with their respective complementary mating faces in a juxtaposed position with respect to one another;

a motor capable of producing an output;

a motor cradle means, a portion of said motor cradle means locate on said first body section and the remaining portion located on said second body section, said portion of said motor cradle means located on said first body section including a first aperture and a first plurality of cradle projection members positioned around the periphery of said first aperture, said portion of said motor cradle means located on said second body section including a second aperture and a second plurality of cradle projection members positioned around the periphery of said second aperture, said motor positionable in said motor cradle means when said mating faces of said first and said second body sections are juxtaposed with respect to one another and a first portion of said motor extends through said first aperture with said first portion of said motor engaged by and held by said first plurality of cradle projection members and a second portion of said motor extends through said second aperture with said second portion of said motor engaged by and held by said second plurality of cradle projection members, said motor releasable from said motor cradle means when said mating faces are distal from one another;

at least one fastening means capable of reversible fixing said mating faces of said first and said second body sections in said juxtaposed position with respect to one another, said fastening means including said second body section having an opening through its mating face and further including a first and second joining member, said first joining member comprising an elongated means integrally formed as a part of said first body section, said elongated means located on said first body section in a position so as to pass through and partially extend beyond said opening in said second body section when said mating faces are juxtaposed to one another;

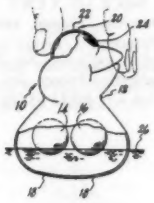
said second joining member comprising a push on cap having a cavity therein and a single orifice opening into said cavity, said cavity capable of frictionally engaging said portion of said elongated means which extends beyond said opening in said second body section when said elongated means is positioned within said opening in said second body section;

at least one appendage member movably connected to said body and operatively associates with said motor, said appendage member capable of moving with respect to said body in response to said output of said motor, movement of said appendage member with respect to said body moving said toy with respect to a support medium.

4,515,572
FLOATABLE TOYS

Norman R. Emms, Codicote, England, assignor to Hestair Kiddicraft Limited, Surrey, England

Filed May 8, 1984, Ser. No. 608,303
Claims priority, application United Kingdom, May 12, 1983, 8313140
Int. Cl.³ A63H *23/00*
U.S. Cl. 446—153 8 Claims



1. A floatable toy comprising a hollow body formed with spaced apertures to let water and air pass into and out of the body, and at least one movable floatation member located within said body, the arrangement being such that on immersing said hollow body in water the water rises within said body and said floatation member rises and is retained by the body to cause said body to float in a partially submerged condition with the said movable floatation member retained in the region of an upper portion of said hollow body, a hollow cavity being formed within said hollow body to define a socket in said upper portion of said hollow body which receives said floatation member in said partially submerged condition of said hollow body, said socket forming part of the body shape of the toy and being so constructed that said floatation member is visible when it is in said socket in said partially submerged condition of said hollow body.

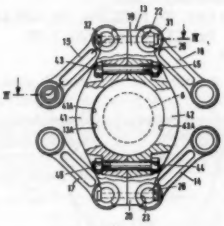
4,515,573
DIFFERENTIAL COUPLING

Johann Eichinger, Vaterstetten, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 312,070, Oct. 16, 1981, abandoned.
This application Feb. 3, 1984, Ser. No. 576,641
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049054
Int. Cl.³ F16C *1/02*
U.S. Cl. 464—69 1 Claim

1. In a drive arrangement which includes: a rotatably supported drive axle; a drive sleeve provided around said drive axle approximately coaxial therewith and supported for rotation independently thereof, said drive sleeve having an inner diameter which is substantially larger than the outer diameter of said drive axle, and said drive sleeve and drive axle being supported for radial movement relative to each other; and joint coupling means for operatively coupling said drive sleeve and said drive axle, said joint coupling means including radially extending first flange means on said drive sleeve, radially extending second flange means on said drive axle, a floating

intermediate member having an opening therethrough which has an inner surface and has a diameter substantially larger than that of said drive axle, said drive axle extending through said opening in said intermediate member, first and second link elements which each have one end pivotally supported on said first flange means and a further end pivotally supported on said intermediate member at a location spaced radially outwardly from said opening therethrough, and third and fourth link elements which each have one end pivotally supported on said second flange means and a further end pivotally supported on said intermediate member at a location spaced radially outwardly from said opening therethrough, said further ends of said first and second link elements respectively being near said further ends of said third and fourth link elements; the improvement comprising wherein said intermediate member includes first and second parts which each have thereon a respective portion of said inner surface of said opening through said intermediate member, said intermediate member being divided into said first and second parts along a dividing plane which extends approximately radially and axially of said drive axle and which extends between said further ends of said first



and third link elements and between said further ends of said second and fourth link elements, and wherein said intermediate member includes fastening means for releasably securing said first and second parts to each other, said fastening means including first and second bolts which extend through aligned openings in said first and second parts of said intermediate member approximately perpendicular to said dividing plane on diametrically opposite sides of and at locations spaced radially from said opening through said intermediate member, said first bolt being located in the region of said further ends of said first and third link elements and said second bolt being located in the region of said further ends of said second and fourth link elements, and said fastening means further including third and fourth bolts which extend through aligned openings in said first and second parts of said intermediate member approximately perpendicular to said dividing plane on diametrically opposite sides of and adjacent to said opening through said intermediate member, said third and fourth bolts substantially preventing deformation of said first and second parts of said intermediate member in response to operational forces applied to said intermediate member by said link elements during operational use of said drive arrangement.

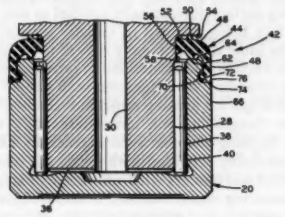
4,515,574

UNIVERSAL JOINT SEAL WITH MULTIPLE LIPS

Philip J. Mazziotti, Toledo, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Filed Feb. 16, 1983, Ser. No. 467,131
Int. Cl.³ F16D *3/33*; F16C *33/78*; F16J *15/34*
U.S. Cl. 464—131 **3 Claims**

1. In combination, a universal joint seal, a cross, and a bearing cup, said cross having a body and a trunnion, said cross also having an annular shoulder and an adjacent surface of circular cross section at the juncture of said body and said trunnion, said adjacent surface being between said shoulder and said trunnion, said bearing cup having an annular groove portion near an open end of said cup which receives said trunnion and having a substantially planar, annular surface at the open end, said seal comprising a resilient sealing member having at least two spaced lips engaging said annular shoulder and a third lip engaging said adjacent surface, said sealing member also having additional lips engaging said annular surface of said bearing cup and the groove portion of said bearing cup, a first of said additional lips engaging said annular surface along a narrow annular area, said first additional lip being substantially aligned



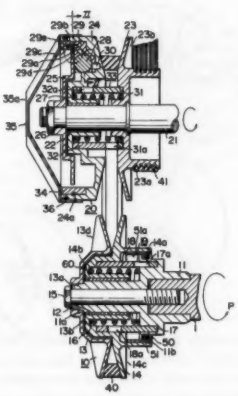
with one of said two lips engaging said annular shoulder, at least one of said additional lips engaging the annular groove portion of said bearing cup along a narrow, annular area, and an additional one of said additional lips being spaced from said one additional lip and engaging the side of said annular groove portion opposite the open end of said cup along a narrow, annular area.

4,515,575

TORQUE TRANSMISSION SYSTEM

Hiroji Kinbara, Aichi; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Hideyuki Hayakawa, Nishio; Masaaki Takizawa, Mishima; Masaru Tamura, and Yasunobu Jufuku, both of Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 11, 1981, Ser. No. 291,946
Claims priority, application Japan, Aug. 22, 1980, 55-116112
Int. Cl.³ F16H *11/06*
U.S. Cl. 474—13 **16 Claims**



1. A torque transmission system including: a pulley unit comprising a fixed pulley part fixed to a shaft for rotation therewith a movable pulley part disposed in axially opposite relationship to said fixed pulley part to cooperate therewith to define a circumferential belt-receiving groove and being movable in the axial direction of said shaft toward and away from said fixed pulley part to vary the width of said belt-receiving groove; a V-belt received in said belt-receiving groove; circumferentially spaced holders fixed to the side of said movable

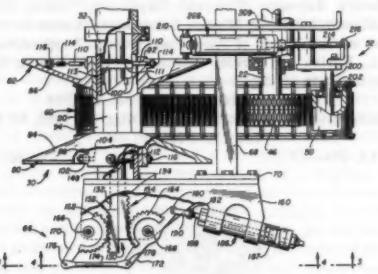
pulley part opposite to the side thereof which is contacted by said V-belt; a fixed plate fixed to said shaft against axial movement and disposed axially outwardly of said holders; at least one fly weight disposed between each of said holders and said fixed plate and being centrifugally movable in the radial direction of said shaft to axially displace said holder and said movable pulley part relative to said fixed pulley part; one of each holder, said fixed plate and said movable pulley part providing a holding surface substantially parallel to said shaft, said holding surface being adapted to radially support said fly weight when the same is centrifugally moved to its radially outermost position; each of said holders being provided with substantially radially extending side edges and with flanges extending along said side edges for guiding radial movement of said fly weight; adjacent flanges of each circumferentially adjacent pair of holders defining therebetween a generally radially extending space and being provided with means for communicating the interiors of said holders with said radially extending space; said communicating means disposed in said flanges adjacent to said holding surface; said movable pulley part being provided with a lubricant guiding wall faced to each of the radially extending spaces and circumferentially adjacent pair of holders for centrifugally guiding lubricant to said communicating means.

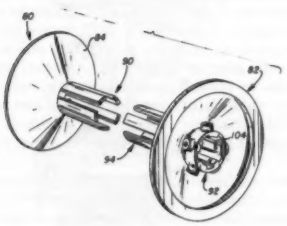
4,515,576

VARIABLE SPEED TRANSMISSION

William S. Wiens, 5508 Bent Tree Dr., Lake Kiowa, Tex. 75248

Continuation of Ser. No. 234,436, Feb. 13, 1981, abandoned.
This application Mar. 1, 1984, Ser. No. 583,797
Int. Cl.³ F16H *9/18*
U.S. Cl. 474—29 **24 Claims**





1. A variable speed transmission for transmitting rotational forces between a first shaft and a second shaft comprising:

chain-belt engagement means communicating with the first shaft;

a variable effective diameter pulley communicating with the second shaft, said pulley comprising a pair of pulley halves having opposed inclined belt engaging faces and a centerline defined by a plane between the pulley halves and equally spaced therefrom, said pulley halves further having a continuous belt engaging surface;

means for varying the effective diameter of said pulley comprising a split shaft having two half shafts extending within said pulley, each half shaft engaging one of said pulley halves such that as said half shafts of said split shaft are moved relative to one another, said pulley halves are moved one relative to the other, and controls for engaging the exterior of each shaft half for moving said half shafts of the split shaft simultaneously such that the center line of said pulley remains fixed as said pulley halves move together or apart; and

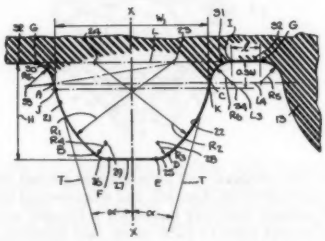
an endless chain-belt assembly encompassing said chain-belt engagement means and the variable effective diameter pulley to transmit rotation between the first and second shafts.

4,515,577

LOW BACKLASH-HIGH-TORQUE POWER TRANSMISSION SYSTEM AND TOOTHED BELT USED THEREIN

Thaddeus F. Cathey, Woodbury; John C. Gaynor, Wolcott, and Rodney J. Nelson, Southbury, all of Conn., assignors to Uniroyal, Inc., Middlebury, Conn.

Filed Oct. 20, 1982, Ser. No. 435,435
Int. Cl.³ F16G *5/20, 1/28*
U.S. Cl. 474—204 **36 Claims**

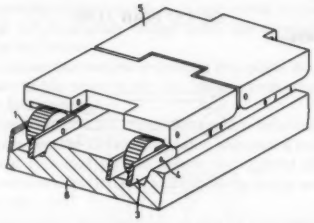


1. A flexible power transmission belt having a plurality of teeth, said belt teeth being separated by belt cavity portions, each belt tooth in longitudinal cross-section being symmetrical about a belt tooth center line, said belt tooth including a root portion, a tip portion and opposite convex arcuate flank portions extending from said tip portion, each said belt cavity portion being symmetrical about a belt cavity center line, said belt tooth root portion being defined at least partly by first and second arcs approximating the arc of a circle on opposite sides of said belt tooth center line extending into the corresponding flank portions of the belt tooth and said belt cavity having a base portion connecting said first arc of each tooth with said second arc of the next consecutive tooth, said base portion which in longitudinal cross-section is a line coinciding with a belt land line which is colinear with base portions of other belt cavities on said belt, said belt tooth having a height dimension measured between the extremity of said tooth tip portion and said belt land line and having a width dimension measured between said opposite flank portions along a line parallel to such belt land line and including the points at which said first and second arcs intersect said flank portions, said belt tooth having a height to width relation within a first predetermined range, each said opposite flank portion being formed of a curve which approximates the arc of a circle whose center of curvature lies substantially on said belt land line on the side of the belt tooth center line which is opposite that of the flank portion in question and which curve is such that a tangent line drawn to it at the point thereon which is at a distance from the belt land line equal to 0.3 times the width dimension of the belt tooth forms an angle with respect to the tooth center line which is within a second predetermined range, wherein said first predetermined range is from 0.50 to 0.67 and said second predetermined range is from 18 degrees to 23 degrees.

4,515,578
ROLLER CHAIN AND ITS USE FOR THE MOVEMENT OF ONE SURFACE IN BEARING RELATION WITH ANOTHER

Raymond Burger, 7, place de la Fleur, Sainte-Marie-Aux-Mines (Haut-Rhin), France

Filed Sep. 1, 1982, Ser. No. 413,620
Claims priority, application France, Sep. 1, 1981, 81 16738
Int. Cl.³ F16G 13/02
U.S. Cl. 474—231 6 Claims

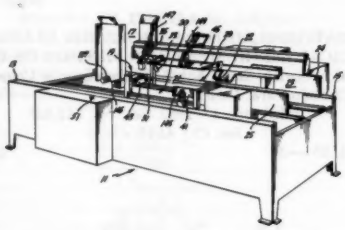


1. A roller chain disposed in compression between a movable plate and a fixed frame, comprising rollers (1) mounted on sleeves (2) on axles (4) and spaced apart by links (3), and guide means for the chain provided on at least one of said plate and frame, said plate and frame contacting opposite sides of the peripheries of the same said rollers.

4,515,579
PROGRAMMABLE CASE SET-UP AND BOTTOM SEALING MACHINE

Joel M. Beckett, Eatonville, Wash., assignor to Marq Packaging Systems, Inc., Yakima, Wash.

Filed Oct. 20, 1982, Ser. No. 435,363
Int. Cl.³ B31B 3/00
U.S. Cl. 493—1 39 Claims



1. A programmable case set-up and bottom sealing machine comprising:

(A) conveyor means for receiving flattened cases from a hopper and sequentially moving said cases first to a case set-up station and, then, to a mandrel station;

(B) erecting means located at said case set-up station for erecting flattened cases moved to said case set-up station by said conveyor means;

(C) flap folding means located at said case set-up station for selectively folding the bottom minor and major flaps of cases erected by said erecting means;

(D) compression means located at said mandrel station for pressing together the folded bottom minor and major flaps of an erected case moved from said case set-up station to said mandrel station by said conveyor means;

(E) a control/display unit for receiving programming information and instructions entered by an operator and displaying operator usable alphanumeric information;

(F) a plurality of sensing devices coupled to said conveyor means, said erecting means, said flap folding means and said compression means for sensing the operation of said conveyor means, said erecting means, said flap folding means and said compression means;

(G) a plurality of controlled devices coupled to said conveyor means, said erecting means, said flap folding means and said compression means for controlling the operation of said conveyor means, said erecting means, said flap folding means and said compression means; and,

(H) a central processing unit coupled to said control/display unit, said plurality of sensing devices and said plurality of controlled devices for:

(1) receiving and storing said programming information and instructions entered by an operator;

(2) receiving information reagrding the operation of said conveyor means, said erecting means, said flap folding means and said compression means sensed by said sensing means; and,

(3) controlling said conveyor means, said erecting means, said flap folding means and said compression means via said plurality of controlled devices such that:

(a) flattened case are moved by said conveyor means to said case set-up station;

(b) flattened cases moved to said case set-up station by said conveyor means are erected at said case set-up station by said erecting means;

(c) the bottom minor and major flaps of erected, cases at said case set-up station are selectively folded by said flap folding means;

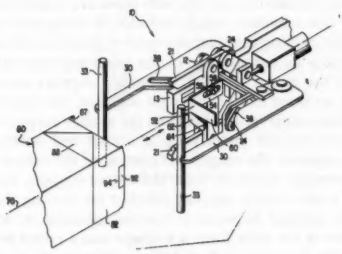
(d) erected and bottom flap folded cases are moved by said conveyor means to said mandrel station; and,

(e) the bottom minor and major flaps of cases at said mandrel station are compressed by said compression means.

4,515,580
BOTTOM SEALING TAB PREBREAKING APPARATUS

Harold Lovelace, Saraland, Ala., assignor to International Paper Company, New York, N.Y.

Filed May 25, 1982, Ser. No. 381,680
Int. Cl.³ B31B 5/74
U.S. Cl. 493—183 9 Claims



1. A bottom end closure pre-breaking apparatus for a container having two opposed pairs of bottom closing and forming flaps which are folded towards each other to define the container bottom, one bottom end defining flap having an integral tab positioned along one free edge thereof, the free edge of said tab carrying flap being received by a mouth defined by both its opposite and its two adjacent flaps, the said tab defined by two spaced cuts extending from the free edge of said tab flap, the tab initially lying in the plane of the flap from which it is formed, the tab being foldable about a fold line defined by the connection of the tab with the remainder of the tab flap, the apparatus including means for positioning a container having bottom flaps which are to be folded from an initial position to form a container bottom, said apparatus also including means

for folding said tab flap towards its bottom forming position, the improvement comprising, means forming an abutment positioned in the path of the tab as its respective tab flap swings towards its bottom forming position from an initial position, whereby said tab is broken out from the plane of its flap and towards its bottom forming position, the mouth subsequently receiving the tab and its flap to fold the tab back against its flap to thereby form a container bottom having no raw paperboard edges through which wicking would occur, said abutment means comprising a bracket, said bracket having two legs at an angle to each other, the first leg having an aperture extending therethrough for the reception of a fastening element, the second leg including a curved abutment portion and a planar abutment portion, the curved abutment portion adapted to strike said tab out of the plane of the flap from which it is formed, the planar abutment adapted to abut a free end of a bottom flap and thereby assist in positioning a carton on a bottom forming machine.

4,515,581

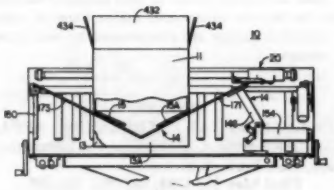
MACHINE FOR ERECTING, HOLDING AND DISCHARGING A FOLDING CASE

Edwin A. Molitor, Miami Township, Clermont County; Edward Crain, Blue Ash, and Guy W. Lampe, Anderson Township, Hamilton County, all of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Sep. 28, 1983, Ser. No. 536,766

Int. Cl.³ B31B *5/60*

U.S. Cl. 493—183 **5 Claims**



1. A device for erecting a folding carton having lower end flaps and lower side flaps and for holding the folding carton which comprises two parallel side members, a table intermediate the side members which includes an elongated input segment and an elongated output segment, means on the segments for hinging an output edge of the input segment to an input edge of the output segment, an anchor support member supporting an input end of the input segment, the input segment extending cantilever-fashion from the anchor support member, an output support underlying an output end portion of the output segment, the output end portion of the output segment being movable upwardly from the output support, means connected to the anchor support member for moving the anchor support member between a lowered position in which the segments of the table form a V-shape and a raised position in which the segments of the table are substantially horizontally aligned, the lower end flaps of the carton being engageable with the segments when in lowered position to partially fold the lower end flaps, the lower end flaps being further folded when the segments of the table are advanced from the lowered position to the raised position, side flap folding members hingedly mounted by hinge means or respective side members on opposite sides of the table, the hinge means for the side flap folding members being substantially horizontal and parallel to the table segments and at substantially a horizontal plane of the table segments when the table segments are in a raised position, means connected to the side flap folding members for swinging the side flap folding members between a lowered position free of the table segments and a raised position underlying and supporting the lower side flaps in closed position, and means connected to one of the side members for sliding the carton with folded lower flaps off the output end of the output segment to remove the carton from the table segments.

4,515,582

METHOD OF INITIATING AN OPERATION

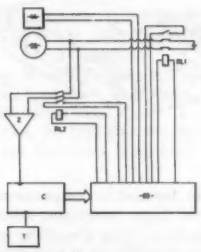
Peter Cox-Smith, Bletchley; Colin Calvert, Ampthill, and John Wesley, Wavendon, all of England, assignors to Hoccum Developments Limited, Slough, England

Filed Feb. 22, 1983, Ser. No. 468,563

Claims priority, application United Kingdom, Feb. 22, 1982, 8205154

Int. Cl.³ B04B *13/00*

U.S. Cl. 494—7 **13 Claims**



1. A method of initiating an operation in dependence upon the combined mass of an element and matter which is in or on the element, comprising the steps of applying a driving force to the element, passing a flow of matter over or through the element so that there is an interchange between the element and the flow varying the driving force so as to substantially change the speed at which the element is driven, measuring the rate of change of speed, and initiating the operation when the rate of change of speed is above or below a predetermined value.

4,515,583

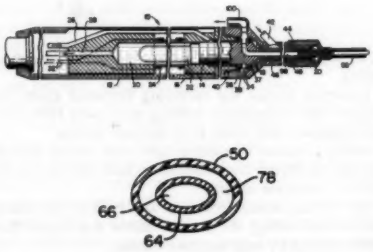
OPERATIVE ELLIPTICAL PROBE FOR ULTRASONIC SURGICAL INSTRUMENT AND METHOD OF ITS USE

Richard A. Sorich, Santa Ana, Calif., assignor to CooperVision, Inc., Menlo Park, Calif.

Filed Oct. 17, 1983, Ser. No. 542,435

Int. Cl.³ A61B *17/20*

U.S. Cl. 604—22 **15 Claims**



1. In an ultrasonic surgical aspirator for breaking apart and removing tissue from an operative site recessed within a body, the aspirator including a transducer for converting high-frequency electrical energy to mechanical vibrations, an elongated vibration transmitting body having one end operably associated with the transducer and its other end adapted to

threadably receive and support an operative probe, and a housing for supporting the transmitting body and the transducer and providing an inlet and outlet for irrigation fluid to be circulated over the operative site, the improvement wherein said operative probe comprises,

a threaded mounting base portion adapted to be threadably mounted onto said transmitting body and an elongated slender body portion means having a longitudinal axis adapted to be inserted into a tissue body, said elongated portion terminating in an open end having free end surface means defining an operative tip for engaging and breaking apart tissue at the recessed operative site,

an axial opening extending through said probe to enable the removal of broken-up tissue from the operative site through the probe,

said free end surface means extending in a plane disposed at an acute angle relative to the longitudinal axis of the slender body portion,

said slender body portion means having a substantially elliptical cross section defining a major axis and a minor axis from said free end surface means throughout at least a major portion of its length, and vibrating along said longitudinal axis, and

a plane containing the longitudinal axis of the slender body portion means and the major axis of the substantially elliptical cross section thereof intersecting the plane of said free end surface means along the major axis of the oval or elliptical open end at said tip, wherein ultrasonic cutting time is reduced by the removal of said tissue in furrows corresponding in width to the major axis of said free end surface means and wherein wound spreading is reduced along the minor axis of said free end surface means of the slender body portion means.

4,515,584

ARTIFICIAL PANCREAS

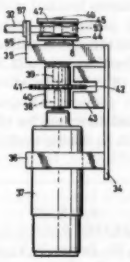
Hiroshi Abe, Nishinomiya; Motoaki Shichiri, Osaka; Ryuzo Kawamori, Kobe; Tasuku Ichoh, Suita; Kenji Iwatani, Takatsuki; Mamoru Higuchi, Suita; Kiyotaka Takagi, Kyoto; Norihiko Okamoto, Ikeda, and Toshiyuki Okudaira, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 29, 1983, Ser. No. 508,910

Claims priority, application Japan, Jul. 6, 1982, 57-118114; Jul. 9, 1982, 57-120078

Int. Cl.³ A61J *7/00*

U.S. Cl. 604—66 **11 Claims**



1. An artificial pancreas comprising a blood sugar determination unit for measuring the blood sugar of the living body, an injection unit including a container for a hypoglycemic agent, a container for a hyperglycemic agent, a feed pump for the hypoglycemic agent and a feed pump for the hyperglycemic and is adapted to inject the hypoglycemic agent or the hyperglycemic agent into the living body, and an arithmetic control unit for calculating the dose of the hypoglycemic agent and the hyperglycemic agent based on the blood sugar measurement and controlling the pumps of the injection unit in accordance with the result of said calculation;

the artificial pancreas being characterized in that the blood sugar determination unit has an electrode means to be inserted into the living body for measuring the blood sugar, the feed pump including a plurality of rollers rotatably mounted on a rotatable roller holder along the outer periphery of the holder and an elastic tube having an intermediate portion reeved around some of the rollers under tension, the arithmetic control unit including a microcomputer;

wherein the blood sugar measuring electrode means comprises a bar-like anode insulated except at its front end serving as an electrode reaction portion and at its rear end serving as a lead wire connecting portion, and a cylindrical cathode having said anode fixedly provided therein, the surface of the front end of said anode being covered with a hydrophilic semipermeable membrane permeable to hydrogen peroxide, then with an immobilized glucose oxidase membrane and further with a hydrophilic semipermeable membrane permeable to glucose, oxygen and hydrogen peroxide by lamination.

4,515,585

SYSTEM FOR PARENTERAL ADMINISTRATION OF AGENT

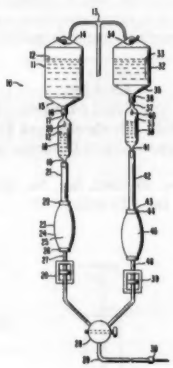
John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

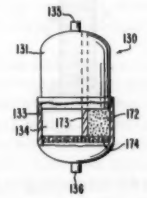
Continuation of Ser. No. 381,402, May 24, 1982, Pat. No. 4,432,754. This application Oct. 31, 1983, Ser. No. 547,427

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—85 **7 Claims**





1. A parenteral delivery system for administering a beneficial agent formulation to an animal, the system comprising:

(a) a primary path for the flow of a parenterally acceptable fluid therethrough;

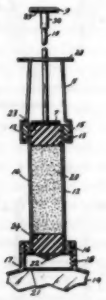
(b) a formulation chamber in the primary path, the formulation chamber comprising:
(1) a wall surrounding a lumen;
(2) an inlet for letting fluid from the primary path into the formulation chamber;
(3) a beneficial agent in the formulation chamber that forms an agent formulation with fluid that enters the formulation chamber;
(4) a film extended from the top to the bottom of the formulation chamber in the formulation chamber; said film separating said agent from the flow path and comprising releasing means that aids in controlling the rate of release of beneficial agent from the formulation chamber;
(5) an outlet for letting an agent formulation leave the formulation chamber;
(c) a secondary path for the flow of a parenterally acceptable fluid therethrough;
(d) a formulation chamber in the secondary path, the formulation chamber comprising:
(1) a wall surrounding a lumen;
(2) an inlet for letting fluid from the secondary path into the formulation chamber;
(3) a beneficial agent in the formulation chamber that forms an agent formulation with fluid that enters the formulation chamber;
(4) a film extended from the top to the bottom of the formulation chamber in the formulation chamber, said film separating said agent from the flow path and comprising releasing means that aids in controlling the rate of release of beneficial agent from the formulation chamber;
(5) an outlet for letting an agent formulation leave the formulation chamber; and,
(e) a common path in communication with the primary path and in communication with the secondary path for receiving agent formulation, which common path when the system is in use is in communication with the animal for administering beneficial agent formulation thereto.

4,515,586

POWDER SYRINGE MIXING SYSTEM

Douglas W. Mendenhall, Libertyville, and Ping Li, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 30, 1982, Ser. No. 445,399
Int. Cl.³ A61J *1/00*
U.S. Cl. 604—87 **8 Claims**



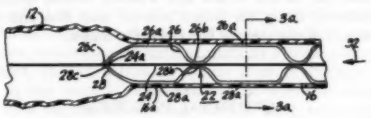
1. A mixing system for first storing and subsequently transferring a powdered medicament to a solution container comprising:
a hollow chamber member;
a piston plug slidably mounted in sealing engagement with one end of said hollow chamber member;
a stopper member slidably mounted in the opposite end of said hollow chamber member from said piston plug, said stopper member having a piercing tip on one side thereof;
external rotatable engagement means extending from said hollow chamber member substantially adjacent said stopper member;
complementary internal rotatable engagement means in the neck portion of the solution container;
removable means for exerting force on said piston plug in a direction substantially parallel to the axis of said hollow chamber member;
a rupturable diaphragm positioned in the neck portion of the solution container so that rotatable engagement of said external and internal rotatable engagement means will cause said piercing tip to rupture said pierceable diaphragm;
whereby the exertion of force on said piston plug by said removable means for exerting force after the rupturing of said rupturable diaphragm by said piercing tip will effect a transfer of the powdered medicament from said hollow chamber member into the solution container.

4,515,587

IAB HAVING APPARATUS FOR ASSURING PROPER BALLOON INFLATION AND DEFLATION

Peter Schiff, Cookeville, Tenn., assignor to SMEC, Inc., Cookeville, Tenn.

Filed Feb. 14, 1983, Ser. No. 466,063
Int. Cl.³ A61M *29/02*
U.S. Cl. 604—96 **24 Claims**



1. An intra-aortic balloon assembly comprising:
an inflatable balloon formed of a non-stretchable plastic material and having a distal end terminating in a tip and having an open proximal end and a longitudinal axis extending between the proximal end and the tip;
an elongated catheter tube having a distal end communicating with and air-tightly joined to the open proximal end of said balloon and having a proximal end for receiving positive and negative pressure pulses for selectively inflating and deflating said balloon;
elongated resilient means located within said balloon assembly for selectively preventing collapse of said balloon;
operating means extending into said catheter tube and coupled to said resilient means; said operating means being movable in a first direction for effecting expansion of said resilient means to prevent collapse of said balloon and movable in a second direction for effecting compression of said resilient means to enable said balloon to substantially fully collapse.

4,515,588

I.V. FLOW REGULATOR

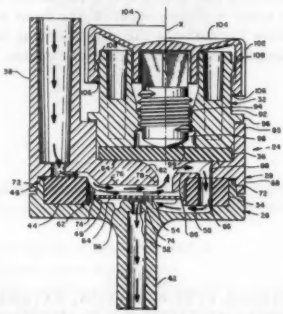
Pasquale J. Amendolia, St. James, N.Y., assignor to Health Care Concepts, Inc., Allamuchy, N.J.

Filed May 16, 1983, Ser. No. 495,058
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—118 **11 Claims**

1. Apparatus for administering liquid to a patient at a selected constant rate of flow comprising:
a. means for being connected to said patient for the administration of said liquid;
b. reservoir means for containing a supply of said liquid supported at an elevation sufficient to obtain gravitational force for the flow of said liquid;

c. tube means for delivering said liquid from said reservoir means to said administration means; and

d. regulator means in said tube means for selecting and maintaining a constant rate of flow of said liqid, comprising, a housing with inlet and outlet means for receiving and discharging said liquid, respectively, diaphragm means having a thickened rim with a central thin membrane within said housing for separating said inlet means from said outlet means and forming inlet and outlet chambers, respectively, said membrane having a surface contiguous with a surface on said thickened rim, means in said housing comprising an annular bulge contacting said surface on said membrane adjacent said thickened rim for stretching said membrane and insuring proper location and tautnesss of said membrane, said inlet means receiving



said liquid from said reservoir means, said outlet means delivering said liquid to said administration means, orifice means for directing liquid from said outlet chamber into said outlet means, said diaphragm means supported within said housing to that said membrane effectively controls flow through said orifice means into said outlet means, passageway means bypassing said membrane for permitting flow of said liquid from said inlet chamber to said outlet chamber, and valve means for controlling flow through said passageway means, said valve means establishing the flow rate through the regulator means, said membrane in response to differential pressures exercised by liquid in said inlet and outlet chambers maintaining constant the flow rate of said liquid as selected by said valve means.

4,515,589

PERISTALTIC PUMPING METHOD AND APPARATUS

Jon W. Austin, 1909 E. Camino de Los Ranchos, Phoenix, Ariz. 85022, and Cecil C. Vaughn, 421 N. 18th St., Phoenix, Ariz. 85006

Continuation-in-part of Ser. No. 246,408, Mar. 23, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 510,656

Int. Cl.³ A61M *5/00*; F04B *43/12*

U.S. Cl. 604—122 **3 Claims**

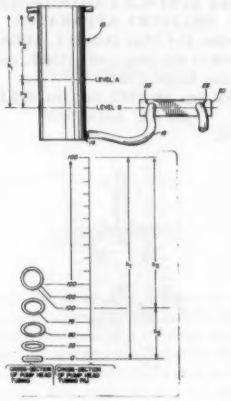
1. A system for pumping liquid from a source, said system including a reservoir for fluid, a peristaltic pump in communication with said reservoir, said peristaltic pump having a raceway and a rotor rotatable along said raceway, said pump having an inlet and outlet and flexible pumping means connectable between said inlet and outlet and successively compressible by said rotor, said pumping means comprising:

(a) an outer flexible tube defining an interior passageway extending between said inlet and outlet;

(b) connectors at either end of said tube at said inlet and outlet;

(c) an inner flexible tube having an inlet and outlet, said inner flexible tube having a lumen concentrically disposed within said outer tube, the exterior of said inner tube and the interior of said outer tube defining an annular space extending substantially from said inlet to said outlet, said inner tube being elastomeric and being selected to flatten in cross-section under decreasing hydrostatic pressure;

(d) means for venting said annular space to atmosphere whereby said inner tube will begin to collapse when the fluid level in said reservoir approaches a first pre-determined level and whereby said inner tube collapses when the liquid level of said reservoir reaches approximately the elevation of the inlet of said pump whereby flow of liquid is halted and infusion of air is prevented; and



(e) inlet occluding valve means at the inlet to said inner flexible tube having a normally closed position and openable in response to a positive pressure head.

4,515,590

AUTOMATIC INJECTION APPARATUS

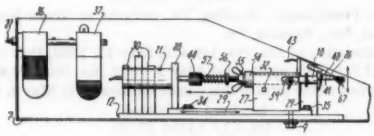
Nisim Daniel, Kiriat Tivon, Israel, assignor to Abic Ltd., Israel

Filed Feb. 3, 1983, Ser. No. 463,559

Claims priority, application Israel, Feb. 16, 1982, 65031

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—144 **17 Claims**



1. An automatic injection apparatus, comprising

a housing formed by a plurality of walls,

one of said walls extending obliquely and constituting an injection wall,

a aperture formed in said injection wall,

a syringe disposed within said housing,

an injection needle disposed on one end of said syringe,

a support disposed within said housing upon which said syringe is tightly mounted and adapted to slide therealong, so that said needle protrudes through said aperture,

means for introducing injection fluid into said syringe,

a two-way, fluid-actuated, double action piston coupled to said syringe for moving the latter in both a forward and a backward direction along said support,

means for fluidly connecting said piston to a source of fluid under pressure, said fluid connecting means including

means for introducing pressurized fluid on one side of said

piston, to cause the same and said syringe to move in the forward direction, and

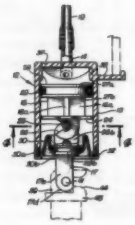
means for introducing pressurized fluid on another side of said piston to cause the same and said syringe to move in the backward direction.

4,515,591

DISPOSABLE SYRINGE CARTRIDGE FOR FLUID DELIVERY APPARATUS

Karl J. Hemmerich, Del Mar; Donald L. Millerd, and Anthony B. Semedo, both of San Diego, all of Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Sep. 28, 1982, Ser. No. 425,534
Int. Cl.³ A61M *5/20*
U.S. Cl. 604—152 **27 Claims**



1. For use in a syringe pump, a disposable plastic syringe cartridge, comprising:

a hollow cylinder having an open end and a closed end, said cylinder having a pair of inlet and outlet nipples projecting from said closed end of said cylinder, each of said nipples adapted for connection to an I.V. tube;

a piston head slidably received within said cylinder;

a sealing ring disposed around said piston head for forming a circumferential sealing relationship with said cylinder;

a piston rod for reciprocating said piston head along the longitudinal axis of said cylinder;

means for pivotally connecting one end of said piston rod to said piston head; and

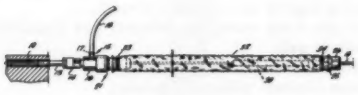
means for engaging the other end of said piston rod to the mounting means of a piston drive system.

4,515,592

CATHETER SHIELD

Paul L. Frankhouser, Reading, Pa., assignor to Arrow International, Inc., Reading, Pa.

Continuation of Ser. No. 149,478, May 13, 1980, Pat. No. 4,327,723. This application May 3, 1982, Ser. No. 374,480
The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—163 **8 Claims**



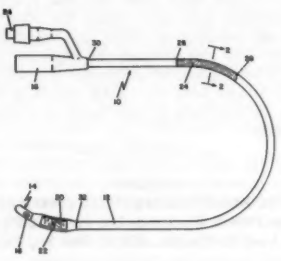
2. A method of catheterization which provides protection for a segment of the catheter against contamination, said method comprising providing a protective shield assembly for the catheter, said shield assembly having front and rear hub members, and guide tube means having a lumen, the guide tube means releasably interconnecting said front and rear hub members so as to provide a disconnectible assembly including the rear hub member, the front hub member and the guide tube means, an elongated transparent plastic sheath covering said guide tube means and sealingly interconnecting said front and rear hub members, said transparent sheath being substantially longer than said guide tube means, and being collapsible when the guide tube means interconnects the front and rear hub members, said front and rear hub members having openings coaxially aligned with said guide tube means when the guide tube means interconnects the lumen of the hub members, the guide tube means and said openings being adapted to receive and pass a catheter through the rear hub member, through the guide tube means and out through the front hub member when the guide tube means interconnects the hub members, the steps which comprise first passing the catheter through the rear hub member, the lumen of the guide tube means, the front hub member and then disconnecting the front and rear hub members and extending the sheath over a substantial length of the catheter by relative displacement of the front and rear hub members along the catheter thereby providing isolation of a substantial length of catheter from contaminants.

4,515,593

MEDICAL TUBING HAVING EXTERIOR HYDROPHILIC COATING FOR MICROBIOCIDE ABSORPTION THEREIN AND METHOD FOR USING SAME

William J. Norton, Berkeley Heights, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Dec. 31, 1981, Ser. No. 336,291
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—265 **8 Claims**

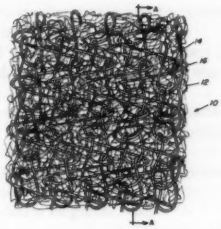


1. A catheter for indwelling introduction into a body opening and comprising an elongated relatively flexible body portion formed of a hydrophobic polymer and normally having a hydrophobic exterior surface and including a hydrophilic coating on a predetermined longitudinally extending portion of the exterior surface only of the body portion intermediate the ends thereof, a portion of said hydrophilic coating defining an aqueous-base microbiocide absorption zone which absorption zone will in use straddle an opening through which the catheter enters the body with only a minor portion of the hydrophilic coating indwelling for preventing entry of pathogenic organisms at the in use site of the body opening through which the catheter passes, and said hydrophilic coating within the body only being coextensive with a minor portion of the catheter that is subjected in use to physiological fluid-dissolved compounds wherein in use indwelling incrustation of the catheter is generally obviated.

4,515,594
SURGICAL SPONGE

John E. Pendergrass, Seneca, and David T. Melton, Walhalla, both of S.C., assignors to The Kendall Company, Boston, Mass.

Filed Jan. 10, 1983, Ser. No. 457,092
Int. Cl.[3] A61F *13/16*
U.S. Cl. 604—384 11 Claims



1. A surgical dressing or surgical sponge material having enhanced absorbance and capillarity characteristics, comprising:

a nonwoven fabric component; and a

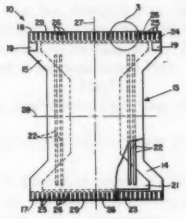
crochet knitted array component;

said crochet knitted array component being interlaced in intimate physical contact by means of stitching through said centrally-disposed nonwoven fabric component.

4,515,595
DISPOSABLE DIAPERS WITH ELASTICALLY CONTRACTIBLE WAISTBANDS

David J. Kievit, North College Hill, and Thomas F. Osterhage, Green Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 26, 1982, Ser. No. 444,543
Int. Cl.[3] A61F *13/20*
U.S. Cl. 604—385 A 5 Claims



1. A disposable diaper having at least one waistband, said diaper comprising a topsheet, a backsheet, and an absorbent element interposed between said topsheet and said backsheet wherein at least one waistband comprises an elastic element interposed between said topsheet and said backsheet and contractibly affixed to said topsheet and to said backsheet by essentially regular transverse regions of securement defining therebetween transverse regions of nonsecurement extending from the outer margin of said waistband across essentially the entire width of said elastic element.

4,515,596

PROCESS FOR AFTERTREATING DYED FIBROUS MATERIAL MADE OF OR CONTAINING CELLULOSE

Hans-Ulrich Berendt, Allschwil, and Marielise Pacher, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,071

Claims priority, application Switzerland, Jul. 27, 1982, 4558/82; May 9, 1983, 2522/83

Int. Cl.³ D06L *3/02;* D06P *3/40, 5/02*

U.S. Cl. 8—107 19 Claims

1. A process for treating unbleached cellulose fiber material comprising the steps of

(i) dyeing said material with a vat, direct or reactive dye which is stable to the liquor used in step (ii) and subsequently

(ii) bleaching and washing the dyed material in a liquor containing a bleaching agent and a stabilizer selected from the group consisting of

(a) an adduct of an aminoalkanediphosphonic acid and an epihalogenohydrin,

(b) a phosphonate oligomer, and

(c) a reaction product of phosphorous acid and a carboxylic acid anhydride or halide,

or a mixture of said stabilizers.

4,515,597

MAGNESIUM COMPLEXES OF OLIGOMERIC PHOSPHONIC ACID ESTERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS STABILIZERS IN ALKALINE, PEROXIDE-CONTAINING BLEACH LIQUORS

Christian Guth, Basel, and Paul Schäfer, Riehen, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Dec. 1, 1983, Ser. No. 557,012

Claims priority, application Switzerland, Dec. 10, 1982, 7216/82; Jan. 25, 1983, 400/83

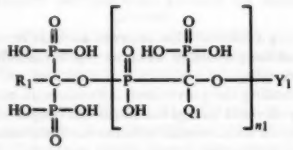
Int. Cl.³ C07F *9/40;* C11D *3/39;* D06L *3/02*

U.S. Cl. 8—107 13 Claims

1. An alkaline bleach liquor containing

(a) a peroxide bleach

(b) a magnesium complex which contains, as ligands, oligomeric phosphonic acid esters of the formula



in which Y_1 is hydrogen or $-COT_1$, R_1, Q_1 and T_1 are each alkyl having 1 to 4 carbon atoms and n_1 is 1 to 16, and

(c) a polyhydroxy compound containing at least 2 hydroxyl groups.

4,515,598

PROCESS FOR DYEING AND PRINTING FIBER MATERIALS CONTAINING HYDROXY AND/OR CARBONAMIDE GROUPS WITH REACTIVE DYE CONTAINING BOTH VINYL SULPHONYL AND FLUORO-TRIAZINYL GROUPS

Fritz Meininger, Frankfurt am Main; Joachim W. Otten, deceased, late of Offenbach am Main; by Ursula Otten, heir, Heidelberg, and by Anna G. Rudolph née Otten, heir, Dillenburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 465,509, Feb. 10, 1983, abandoned, which is a continuation of Ser. No. 340,846, Jan. 20, 1982, abandoned, which is a continuation of Ser. No. 267,780, May 22, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 550,727

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019960

Int. Cl.³ C09B *62/04;* D06P *1/38, 3/66*

U.S. Cl. 8—549 3 Claims

1. A process for dyeing or printing a fibre material containing hydroxy groups, carbonamide groups or both hydroxy and carbonamide groups, which comprises

applying to the fibre material a water-soluble dyestuff containing at least one sulfonic acid group and containing one or more radicals selected from the group consisting of radicals of the formulae

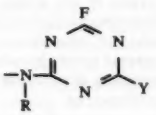
$$SO_2-CH=CH_2$$

$$SO_2-CH_2-CH_2-Hal$$

and

$$SO_2-CH_2-CH_2-A$$

wherein Hal is halogen and A is an acyloxy radical of a monobasic or polybasic acid, and containing a 6-fluoro-1,3,5-triazin-2-ylamino radical of the formula



wherein

Y is a group of the formula

$$O-R^1$$

$$S-R^1$$

or

in which

R^1 is alkyl of from 1 to 4 carbon atoms unsubstituted or substituted by one or two substituents selected from the group consisting of acetylamino; hydroxy; sulfato; B-sulfatoethylsulfonyl; B-thiosulfatoethylsulfonyl; lower alkoxy; sulfo; carboxy; phenyl; naphthyl; phenyl which is substituted by substituents selected from the group consisting of sulfo, carboxy, β-sulfatoethylsulfonyl, β-thiosulfatoethylsulfonyl, methyl, ethyl, methoxy, ethoxy, chlorine, sulfamoyl and carbamoyl; and naphthyl which is substituted by substituents selected from the group consisting of sulfo, carboxy, β-sulfatoethylsulfonyl, β-thiosulfatoethylsulfonyl, sulfamoyl and car-

bamoyl; or R^1 is phenyl or naphthyl or phenyl substituted by substituents selected from the group consisting of carboxy, sulfo, lower alkyl, lower alkoxy, hydroxy, chlorine and β-sulfatoethylsulfonyl, or is naphthyl substituted by substituents selected from the group consisting of carboxy, sulfo, lower alkyl, lower alkoxy, hydroxy, chlorine and β-sulfatoethylsulfonyl;

R^2 is hydrogen or lower alkyl or lower alkenyl or lower alkyl substituted by one or two substituents selected from the group consisting of acetylamino; hydroxy; sulfato; β-sulfatoethylsulfonyl; β-thiosulfatoethylsulfonyl; lower alkoxy; sulfo; carboxy; phenyl; naphthyl; phenyl which is substituted by substituents selected from the group consisting of sulfo, carboxy, β-sulfatoethylsulfonyl, β-thiosulfatoethylsulfonyl, methyl, ethyl, methoxy, ethoxy, chlorine, sulfamoyl and carbamoyl; and naphthyl substituted by substituents selected from the group consisting of sulfo, carboxy, β-sulfatoethylsulfonyl, β-thiosulfaoethylsulfonyl, sulfamoyl and carbamoyl; or R^2 is cyclohexyl; and

R^3 is hydrogen or lower alkyl or lower alkenyl or lower alkyl substituted by one or two substituents selected from the group consisting of acetylamino; hydroxy; sulfato; β-sulfatoethylsulfonyl; β-thiosulfatoethylsulfonyl; lower alkoxy; sulfo; carboxy; phenyl; naphthyl; phenyl which is substituted by substituents selected from the group consisting of sulfo, carboxy, β-sulfatoethylsulfonyl, β-thiosulfatoethylsulfonyl, methyl, ethyl, methoxy, ethoxy, chlorine, sulfamoyl and carbamoyl and naphythyl substituted by substituents selected from the group consisting of sulfo, carboxy, β-sulfatoethylsulfonyl, β-thiosulfatoethylsulfonyl, sulfamoyl and carbamoyl; or R^3 is phenyl or naphthyl or phenyl substituted by substituents selected from the group consisting of carboxy, sulfo, lower alkyl, lower alkoxy, hydroxy and chlorine, or is naphthyl substituted by substituents selected from the group consisting of carboxy, sulfo, lower alkyl, lower alkoxy, hydroxy and chlorine; or R^3 is lower alkoxy, cyano or the group —C(=S)—NH_2 or is amino, lower alkylamino, di-(lower alkyl)-amino, N-methyl-N-phenylamino or phenylamino or phenylamino substituted in the phenyl moiety by substituents selected from the group consisting of sulfo, carboxy, chlorine, lower alkyl and lower alkoxy; or

R^2 and R^3, together with the nitrogen atom, form a heterocyclic ring containing lower alkyl or containing lower alkyl and one or two hetero atoms;

and then fixing said dyestuff on the fibre material at room temperature or at a temperature up to 230° C. in the absence or in the presence of an agent having an alkaline reaction.

4,515,599

PROCESS FOR DYEING PAPER

Adolf Käser, Bottmingen, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

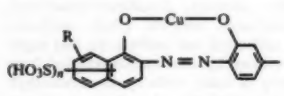
Continuation of Ser. No. 338,725, Jan. 11, 1982, abandoned, which is a continuation of Ser. No. 182,747, Aug. 29, 1980, abandoned. This application Sep. 9, 1983, Ser. No. 530,916

Claims priority, application Switzerland, Jun. 3, 1980, 4287/80

Int. Cl.³ D06P *1/10, 3/60;* D21H *1/46*

U.S. Cl. 8—685 **3 Claims**

1. A process for dyeing paper which comprises applying to the paper a dye of the formula



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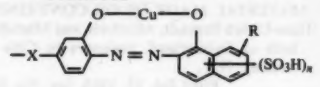


wherein R is hydrogen, hydroxyl or amino, X is azoxy or azo, and n is 1 or 2, and the bond of the complexing oxygen atom in the α-position and the bond of the azo group in the β-position at each of the naphthalene nuclei are interchangeable.

4,515,600

PROCESS FOR THE REMOVAL OF THE SLAG PORTION FROM MOLTEN MIXTURES OF SLAG AND SILICON USING A SEMIPERMEABLE SEPARATING WALL

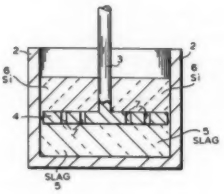
Josef Dietl, Neuötting, and Jörg Kotilge, Burghausen, both of Fed. Rep. of Germany, assignors to Heliotronic Forschungs- und Entwicklungsgesellschaft für Solarzellen-Grundstoffe m.b.H., Burghausen, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,980

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208877

Int. Cl.³ C01B *33/02*

U.S. Cl. 23—293 R **5 Claims**



1. A process for the removal of the slag portion from a molten mixture of silicon and slag, comprising the steps of:

subjecting a molten mixture of silicon and slag to a hydrostatic pressure difference with respect to a space separated from it by at least one semipermeable separating wall, provided with apertures of from about 0.1 to 10 mm inside width, so as to make said separating wall permeable to both said slag and to said silicon when present alone, but permeable only to said slag when a molten mixture of said slag and silicon is present, and permitting the slag to be drawn through said apertures of said separating wall, and to collect in said space, with said silicon being held back.

4,515,601

CARBONACEOUS BRIQUETTE

John E. Charters, 61 W. Delta Green, Port Hueneme, Calif. 93041

Filed May 3, 1982, Ser. No. 373,878

Int. Cl.³ C10L *5/12, 5/14*

U.S. Cl. 44—19 **11 Claims**

1. A method for forming carbonaceous briquettes which comprises,

(a) obtaining carbonaceous material such as from coal, lignite, and or petroleum coke as pulverized fine particle material,

(b) dry blending the pulverized carbonaceous material with a finely divided inorganic sulfur scavenger material selected from alkali metals, alkaline earth carbonates, bicarbonates, metal oxides, hydroxides and salts,

(c) mixing an asphaltene binder material of deep solvent deasphalting below its softening point and providing a ring and ball softening point in the range of 200° F. to 400° F. with said dry mixture of carbonaceous material and said inorganic sulfur scavenger material, and

(e) compressing the mixture thus formed in the absence of external heating to form briquettes of said mixture.

3. The method of claim 1 wherein from 5 to 20 wt.% of the asphaltene binder material is employed.

6. The method of claim 1 wherein the product briquette comprises from 50 to 80 wt.% of coke, from 5 to 20 wt.% of asphaltene binder material and from 10 to 30 wt.% of said inorganic scavenger material.

4,515,602

COAL COMPOSITIONS

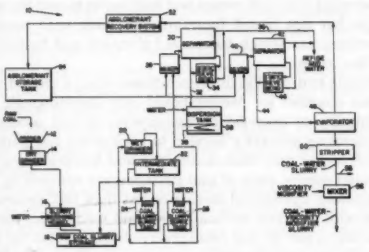
Douglas V. Keller, Jr., Lafayette, and Frederick J. Simmons, Syracuse, both of N.Y., assignors to Otisca Limited, Ltd., Syracuse, N.Y.

PCT No. PCT/US82/00790, § 371 Date Jun. 10, 1982, § 102(e) Date Jun. 10, 1982, PCT Pub. No. WO83/04416, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 10, 1982, Ser. No. 406,730

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **10 Claims**



1. A composition of matter useful as a fuel and for other purposes, said composition consisting essentially of particulate coal and water, said composition having a solids content of at least 50 weight percent based on the total weight of the composition, a particle size distribution of at least 95 percent ≦30 μm×0, and an ash content of not more than 1.5 weight percent based on the dry weight of the coal in the composition.

4,515,603

ANTI-STATIC COMPOSITIONS

J. Irvine Knepper, Manchester, and Dennis C. Sallee, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 968,327, Dec. 11, 1978, Pat. No. 4,356,002. This application Sep. 14, 1982, Ser. No. 418,111

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.³ C10L *1/14*

U.S. Cl. 44—62 **6 Claims**

1. An antistatic composition comprising an oxyalkylated phenol-aldehyde resin and an antistatic agent other than a surfactant.

4,515,604

PROCESS OF PRODUCING A SYNTHESIS GAS WHICH HAS A LOW INERT GAS CONTENT

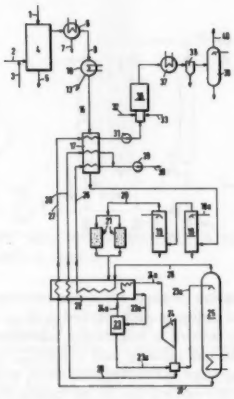
Karl-Heinz Eisenlohr, Dreieich; Hans Gaensslen; Manfred Kriebel, both of Frankfurt, and Heiner Tanz, Dreieich, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,472

Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217366

Int. Cl.³ C10J *3/00*; C10K *1/00*

U.S. Cl. 48—197 R **1 Claim**



1. A process for producing synthesis gas having a low inert gas content and useful in the synthesis of alcohols, especially methanol and the synthesis of hydrocarbons which comprises:

(A) gasifying coal or a heavy hydrocarbon under pressure with a gasifying agent to obtain a raw gas;

(B) cooling the resultant raw gas to a temperature of about 20° to 50° C. in first indirect heat exchange;

(C) removing H_2S and CO_2 from the so-cooled raw gas by scrubbing the same with methanol at a temperature below −25° C. in a multistage scrubbing process to obtain a cold gas mixture containing CO, H_2 and methane;

(D) removing methanol from said cold gas mixture by passing said mixture through a molecular sieve containing bed;

(E) cooling the gas mixture from said molecular sieve containing bed in a second indirect heat exchange to a temperature in the range of −150° to −195° C. and liquifying a portion thereof, separating the liquified portion containing methane and withdrawing a first partial stream of synthesis gas composed of CO and H_2, pressure relieving said first partial stream to effect a further cooling thereof;

(F) feeding said liquified portion to a distillation zone having temperatures in the upper portion of −160° to −195° C. and temperatures in the bottom portion of −120° to −170° C., said distillation zone being maintained at a pressure of 1 to 10 bar, withdrawing as an overhead product from said distillation zone a second partial stream of synthesis gas composed mainly of CO and H_2 with a low methane content, withdrawing a liquid methane-rich fraction from the bottom portion of said distillation zone;

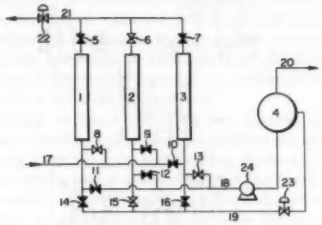
(G) in said second and afterwards in said first indirect heat exchange heating said pressure relieved first partial stream of synthesis gas and said second partial stream of synthesis gas and said liquid methane-rich fraction and vaporizing said fraction;

(H) compressing said vaporized methane-rich fraction and reacting the same with steam and oxygen to produce a product rich in carbon monoxide and hydrogen, said product gas containing CO_2; and

(I) combining at least a portion of said product gas

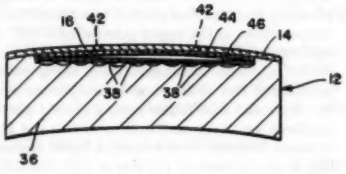
(i) either with said first partial stream of synthesis gas;
(ii) or with said raw gas from said first indirect heat exchange.

4,515,605
SEPARATION PROCESS FOR A GAS MIXTURE
Takehisa Inoue, Tokyo, and Kishio Miwa, Kamakura, both of Japan, assignors to Toray Industries, Incorporated, Japan
Filed Nov. 28, 1980, Ser. No. 211,250
Claims priority, application Japan, Dec. 7, 1979, 54-158126
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—26 **7 Claims**



1. In a separation process for a gas mixture using at least three adsorption columns each packed with an adsorbent having capacity to adsorb a selectively adsorbable component contained in the gas mixture and involving successively repeated following steps as fundamental steps, an adsorption step for the gas mixture carried out by increasing pressure, a purge step using a purge gas enriched with the selectively adsorbable component and a desorption step carried out by reducing pressure, the improvement characterized in that in the adsorption step the starting gas mixture is introduced at a pressure lower than that of the purge gas and, after completion of the adsorption step, at least a portion of the effluent gas from an adsorption colnmn under execution of the purge step is introduced into the adsorption column which has just completed the adsorption step and is about to enter upon the purge step, thereby pressurizing the latter adsorption column.

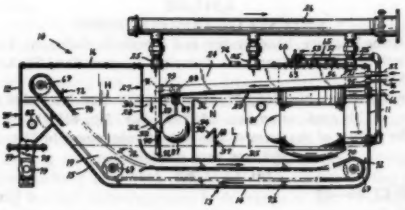
4,515,606
GAS SEPARATING AND VENTING FILTER
Dirk M. de Winter, Solana Beach, Calif., assignor to Brunswick Corporation, Skokie, Ill.
Filed Mar. 19, 1981, Ser. No. 245,444
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—159 **9 Claims**



1. A gas separating and venting filter that is capable of separating gases and liquids and of venting the gases from the filter, comprising:
a housing having walls defining an interior chamber, with inlet means in the housing for the flow of liquid into said chamber, and outlet means in the housing downstream of said inlet means for the flow of liquid out of said chamber;
hydrophobic filter means adjacent one wall of said chamber between said inlet means and said outlet means for passing gas but not liquid therethrough, with vent means for venting gas which has passed through said hydrophobic filter means;
a flexible hydrophobic filter membrane along a second wall of said chamber for passing liquid only therethrough; and
at least one passageway in said second wall extending generally parallel to and along said filter membrane and leading toward said outlet means, said at least one passageway having an open side along its length facing said membrane, and an opposite side defining a smooth surface engageable by the membrane under pressure, and the passageway having a depth within the elastic limits of said flexible membrane, whereby the flexible membrane balloons into the passageway in response to a buildup of pressure in said chamber to restrict the flow of liquid through the passageway, until the membrane ultimately engages the smooth surface of said opposite side of the passageway under extreme pressure to completely shut off the flow of liquid to said outlet means.

9. A gas separating and venting filter that is capable of separating gases and liquids and of venting the gases from the filter, comprising:
a housing having walls defining an interior chamber, with inlet means in the housing for the flow of liquid into said chamber, and outlet means in the housing downstream of said inlet means for the flow of liquid out of said chamber;
hydrophobic filter means adjacent one wall of said chamber between said inlet means and said outlet means for passing gas but not liquid therethrough, with vent means for venting gas which has passed through said hydrophobic filter means;
a flexible hydrophilic filter membrane along a second wall of said chamber for passing liquid only therethrough; and
a plurality of open-sided passageways in said second wall extending generally parallel to each other and parallel to and facing said filter membrane and leading toward said outlet means, each of said passageways comprising a longitudinal cylindrical section of less than 180° presenting a smooth concave surface facing said membrane, the composite depth of said passageways being within the elastic limits of said flexible membrane, whereby the flexible membrane balloons into the passageways in response to a build-up of pressure in said chamber to restrict the flow of liquid through the passageways, until the membrane ultimately engages the concave sides of the passageways under extreme pressure to completely shut off the flow of liquid to said outlet means.

4,515,607
GAS, FLUID AND MINERAL SOLIDS SEPARATION AND RECLAMATION SYSTEM
Girma Wolde-Michael, Little Canada, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.
Filed Apr. 13, 1984, Ser. No. 600,348
Int. Cl.³ B01D *19/00*; E21B *21/06*
U.S. Cl. 55—166 **10 Claims**



1. A hermetic system for the separation and reclamation of a

gas, an aqueous fluid, and solids from a slurry mixture, said system comprising:

an enclosure for a mixture of gas, aqueous fluid and solids, said enclosure being constructed and arranged to create a substantially hermetic interior therein;

inlet means in said enclosure for releasing the mixture into said enclosure interior along a defined passageway, with gas released by the mixture contained therein and solids settlement being augmented therein;

means, in said enclosure, for venting gas released from the mixture to a first location remote from said enclosure;

means, in said enclosure interior, for separating solids from the mixture, said separating means including baffle means for augmenting settling of solids downwardly and a filter assembly constructed and arranged to separate and reclaim an aqueous fluid from the mixture;

outlet means, connected to said filter assembly, for releasing the reclaimed aqueous fluid from said enclosure apart from the gas and for transferring the fluid to a second remote location;

solids dragout means positioned along a lowermost portion of said enclosure for transferring settled solids from said enclosure, said dragout means including means for releasing the solids from said enclosure to a third remote location;

means for introducing a supply of make-up water into said enclosure through said filter assembly;

means in said enclosure for controlling the supply of make-up water, said means including means external to said filter assembly for determining the surface level of the mixture contained in said enclosure;

means, in said enclosure, for skimming the surface level of the mixture contained in said enclosure, said means being external to said filter assembly;

means, connected to said skimming means, for transferring the skimmed mixture portion to said solids releasing means; and

mixture outlet means, in said enclosure for releasing a portion of the mixture from said enclosure interior when a pre-determined level of mixture contained in said enclosure is reached, said mixture outlet means including means for determining when said pre-determined level has been reached.

4,515,608

MULTI-CHAMBER GAS ANCHOR

Joe D. Clegg, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 4, 1982, Ser. No. 354,875
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—193 **4 Claims**

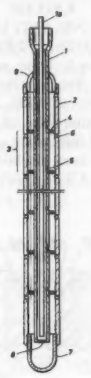
1. A gas anchor for use with a reciprocating well pump for producing fluid from a subterranean reservoir, comprising;

an internal liquid discharge tube in fluid communication with the suction chamber of the pump;

a substantially concentric sleeve surrounding the discharge tube;

a plurality of vertically elongated chambers formed between the discharge tube and the sleeve by means of substantially flat, radially-extensive baffles that extend from the discharge tube to close enough to the sleeve to impede the flow of fluids between the baffles and the sleeve, with each elongated chamber having a volume at least equalling that the suction chamber of the pump; and,

in each elongated chamber, an outlet opening for liquid through the discharge tube wall near the bottom of the chamber and at least one combination fluid inlet and gas outlet opening through the sleeve wall at a location near the top of the chamber, each outlet opening for liquid being relatively small but large enough to resist plugging by solids entrained in the fluid produced from the reservoir, and the combination fluid inlet and gas outlet openings being large enough so that within each elongated



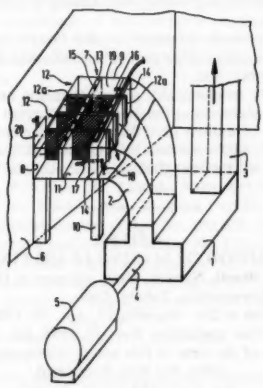
chamber the fluid inflow resistance is significantly less than the outflow resistance.

4,515,609

FLUID CLEANER DEVICE

Leon Cuvelier, Hamme-Mille, Belgium, assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Sep. 14, 1983, Ser. No. 532,018
Int. Cl.³ B01D *46/04, 46/44*
U.S. Cl. 55—270 **7 Claims**



1. A fluid cleaner device, comprising:

a housing including partitions therein defining a plurality of separate cleaning cells arranged in parallel between an inlet and an outlet;

a main filter disposed in each cell of said housing adjacent the inlet for filtration of dust and contaminants from the fluid to be cleaned; and,

a safety filter disposed in each cell of said housing in spaced relationship with the respective main filter and adjacent the outlet, said safety filter being constructed so as to have the characteristics of relatively high permeability and high face flow velocity with a low charge of dust and contaminants thereon so that cleaned fluid from said main filter is allowed to pass through without significant pressure losses during routine operations, but so that, in the event of a fissure in said main filter, said safety filter rapidly

clogs and thus isolates the respective cleaning cell from the other cleaning cells in said housing.

4,515,610

METHOD OF MAKING AND USING GLASS FIBER FORMING FEEDERS

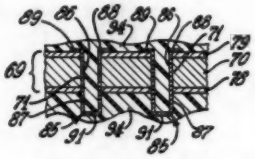
Mohinder S. Bhatti, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 398,536, Jul. 15, 1982, Pat. No. 4,472,248. This application Dec. 19, 1983, Ser. No. 562,947

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.³ C03B *37/095, 37/08*

U.S. Cl. 65—2 **5 Claims**



1. In a method of making glass filaments wherein a plurality of streams of molten glass issuing from an orificed discharge wall of a feeder are attenuated into said filaments, the improvement comprising said discharge wall being fabricated by:

positioning elements in apertures in a member;

providing a layer of elastomeric material about said member and elements positioned therein, said layer being capable of transmitting pressure isostatically and being effective to prevent the migration of working fluid of an after-defined pressing unit between the member and elements;

locating said member and elements having said layer thereabout within a pressing unit having a body of working therein;

applying isostatic pressure to the layers containing said elements and member to mechanically seal the elements to the member; and

heating the mechanically sealed elements and member to fuse the elements to the member to prevent the unwanted passage of molten glass between said elements and said member, said elements having an orifice to permit the passage of molten glass therethrough to establish said streams.

4,515,611

METHOD OF MAKING GLASS FIBERS

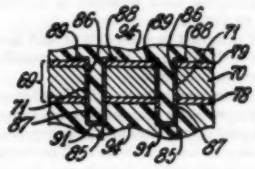
Mohinder S. Bhatti, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 486,777, Apr. 20, 1983, Pat. No. 4,441,904. This application Nov. 19, 1983, Ser. No. 562,948

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.³ C03B *37/08, 37/095*

U.S. Cl. 65—2 **4 Claims**



1. In a method of making glass filaments wherein a plurality of streams of molten glass issuing from an orificed discharge wall of a feeder are attenuauted into filaments, the improvements comprising said feeder being fabricated by:

positioning elements in apertures in a member;

providing a layer of elastomeric material about said member and elements positioned therein, said layer being capable of transmitting pressure isostatically and being effective to prevent the migration of working fluid of an after-defined pressing unit between the member and elements;

locating said member and elements having said layer thereabout within a pressing unit having a body of working therein;

applying isostatic pressure to the layer containing the elements and member to mechanically seal the elements to the member;

joining the pressed member and elements to sections to form said feeder;

installing said feeder at a fiber forming position to receive molten glass; and then

energizing the feeder to fuse the elements to the member to prevent an unwanted passage of molten glass between said elements and said member, said elements having an orifice to permit the passage of molten glass therethrough to establish said streams.

4,515,612

METHOD FOR OPTICAL FIBER FABRICATION INCLUDING DEUTERIUM/HYDROGEN EXCHANGE

Charles A. Burrus, Jr., Fair Haven, and Julian Stone, Rumson, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 369,605, Apr. 19, 1982, abandoned, which is a continuation of Ser. No. 194,882, Oct. 7, 1980, abandoned. This application Feb. 25, 1983, Ser. No. 469,830

Int. Cl.³ C03B *20/00*

U.S. Cl. 65—3.12 **7 Claims**

1. Method for fabrication of an optical fiber preform comprising silica-based glassy material, the method comprising

(a) chemically reacting at least some of the constituents of a moving stream of gas mixture comprising at least one glass-forming precursor compound and an oxidizing medium, the reaction resulting in the formation of a glassy silica-based reaction product,

(b) forming a body by depositing at least a part of the reaction product on a substrate, at least part of the material of the body containing hydrogen bonded to oxygen, and

(c) consolidating at least part of the deposited product by means of a hot zone produced by a heat source external to the body,

characterized in that the method further comprises

(d) replacing at least part of the hydrogen bonded to oxygen with deuterium in a deuterium/hydrogen exchange step carried out subsequent to step (b).

7. Method for fabrication of an optical fiber comprising glassy silica-based material, the method comprising

(a) forming a tubular body by depositing silica-based glassy material in substantially porous, unconsolidated form on the inside surface of a tube comprising silica, at least part of the material of the tubular body containing hydrogen bonded to oxygen,

(b) consolidating the deposited material by means of a hot zone produced by a heat source external to the tubular body,

(c) drawing the optical fiber from a preform formed from the consolidated tubular body,

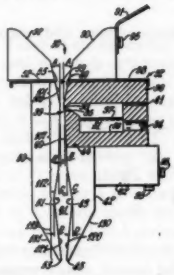
characterized in that the method further comprises

(d) exposing, prior to carrying out step (a), at least a part of the tube to an atmosphere having a partial pressure of at least about 10 Torr of deuterium, and maintaining at least substantially the part of the tube at a temperature above about 300 degrees C. for a period sufficient to result in substantial deuterium/hydrogen exchange in at least some of the material of the tube.

4,515,613
METHOD AND APPARATUS FOR PRODUCING A CONTINUOUS GLASS FILAMENT MAT

David V. Stotler, and Fred S. Coffey, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 4, 1983, Ser. No. 520,096
Int. Cl.³ C03B 37/06
U.S. Cl. 65—4.4 7 Claims



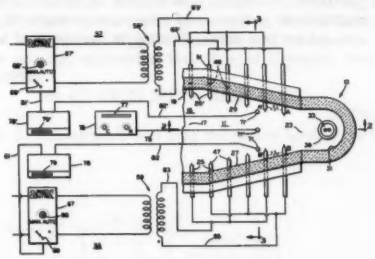
1. Apparatus for producing a mat of continuous glass filaments comprising:
feeder means for supplying a plurality of streams of molten glass;
pull roll means for drawing streams into said filaments, said pull roll having an axis of rotation;
a collection surface for collecting said filaments as said mat;
distribution means having (a) an inlet adapted to receive said plurality of filaments arranged as a substantially planar band, said inlet being oriented substantially parallel to the axis of rotation of the pull roll, (b) a blower section adapted to supply a substantially planar high velocity gaseous stream to contact said filaments, (c) a first control surface extending from said blower section and, (d) a second control surface opposite said first control surface, said first and second control surfaces and said blower section forming (a) a throat section to receive said planar gaseous stream from said blower section; (b) a pre-outlet divergent section extending from said throat section; and (c) a convergent outlet section extending from said diverging section, said convergent outlet section having divergent lateral edges, said divergent pre-outlet section, convergent outlet section and lateral edges being oriented to (i) reduce the velocity of the gaseous stream and advancing filaments and (ii) impart lateral movement to some of the gaseous streams and filaments to advance said filaments as a diverging planar array having a width at said collection surface at least about 4 times the width of the band of filaments entering said inlet; and
means for moving said distribution means to deposit the array filaments discharged from distribution means across the width of the mat being formed.

7. The method of forming a mat of continuous glass filaments comprising:
supplying a substantially planar band of substantially parallel bundles of filaments;
contacting said band of filaments with a substantially planar gaseous stream;
providing a first control surface and a second control surface, said control surface having a shovel shaped recess forming a pre-outlet divergent section and a convergent outlet section to reduce the velocity of the gaseous stream and to impart lateral movement to some of said bundles to advance said filaments as a diverging planar array having a width at an after-defined collection surface at least 6 times the width of the band at the point of initial contact with said gaseous stream;
moving the diverging planar array back and forth across the width of the mat; and
collecting said filaments as said mat.

4,515,614
ELECTRICALLY HEATED FOREHEARTH AND METHOD OF CONTROLLING MOLTEN GLASS TEMPERATURE THEREIN

Marvin L. Barkhau, Elmore; Philip D. Perry; Donald H. Poundstone, both of Toledo, all of Ohio, and James E. Sherman, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 20, 1984, Ser. No. 572,287
Int. Cl.³ C03B 5/02
U.S. Cl. 65—29 19 Claims



15. The method of equalizing the temperature across the cross section of a molten glass flow path through a forehearth comprising immersing electrodes in the molten glass along the opposed sides of its flow path, passing electrical current for Joule effect heating through the glass between electrodes on common sides of the molten glass flow path, and separately controlling the magnitude of the electrical current passed by electrodes on each side of the molten glass flow path to separately control the Joule effect heating of the glass on each side of the flow path.

4,515,615
MANUFACTURING AND USING NITROGEN FERTILIZER SOLUTIONS ON A FARM

John A. Eastin, P.O. Box 389, Lincoln, Nebr. 69140

Division of Ser. No. 379,551, May 18, 1983, Pat. No. 4,427,434, which is a continuation-in-part of Ser. No. 100,825, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 824,289, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 728,788, Oct. 1, 1976, abandoned, which is a division of Ser. No. 581,050, May 27, 1975, abandoned. This application Jun. 23, 1983, Ser. No. 507,718
Int. Cl.³ C05C 3/00, 5/00
U.S. Cl. 71—54 24 Claims

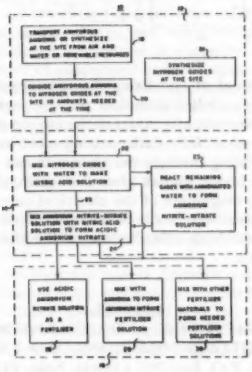
1. Apparatus for nitrogeneous fertilizing comprising:
at least one well;
conduit means for guiding water from said well to areas that are to be irrigated and fertilized;
pump means for pumping water from said well into said conduit means;
a source of ammonia;
first reactor means adapted to communicate with said source of ammonia for continuously burning ammonia in air at a rate of less than 146 pounds of nitrogen per hour at a concentration of between 10% and 25% by volume of ammonia to air at a temperature of between 1,000 and 2,000 degrees Fahrenheit in a continuous process at a pressure between atmospheric pressure and a vacuum pressure of ¼ of an atmosphere to form a continuous stream of nitrogen oxides at a fixed location;
tank means, communicating with said first-reactor means, for oxidizing the nitrogen oxides until at least equimolar

quantities of nitrogen dioxide and nitric oxide are obtained;

mixing means in communication with said conduit means and tank means for continuously mixing at least some of the nitrogen oxides with the flowing water from said well at a rate of less than 12 gallons per minute to form a dilute solution of nitric acid as the nitrogen oxides are formed for application to said areas to be irrigated with the water flowing through said conduit means;

said first reactor means including means for oxidizing ammonia at a rate sufficiently slow to permit cooling by air circulation and single-pass water flow of less than 12 gallons per minute;

second reactor means, communicating with said mixing means, for reacting the remaining oxides with ammonium hydroxide in a continuous process at a pressure between atmospheric pressure and a vacuum pressure of ¼ of an atmosphere in a stream flowing in the range of less than



0.5 gallon each minute of ammoniated water per square foot of reactor means cross section sufficiently ammoniated to provide a pH in the range of 8.0 to 8.4 passing through a mixture of nitrogen oxides in which the ratio of nitric oxide to nitrogen dioxide is greater than one to form am ammonium nitrite liquid solution at a pH above 6.7;

means, communicating with said mixing means and second reactor means, for mixing the ammonium nitrite rapidly with the nitric acid at a pH of less than 2 to form a dilute solution of liquid nitrogen fertilizer containing ammonium nitrate;

said means for mixing said ammonium nitrite and nitric acid including means for converting between 300 and 3,500 pounds of nitrogen to oxides from ammonia and into the form of dilute nitrogen fertilizer solution each day; and

said pump means including means for pumping a total of between one gallon per minute and twenty-five gallons per minute into said mixing means and said second reactor means.

4,515,616

TRIAZOLYL KETONE-OXIMES AND TRIAZOLYL DIOXIMES, THEIR PREPARATION AND THEIR USE AS PLANT GROWTH REGULATORS

Costin Rentzea, Heidelberg; Wolfgang Spiegler, Ludwigshafen, and Johann Jung, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

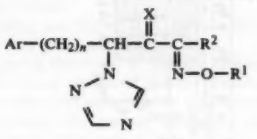
Filed May 27, 1983, Ser. No. 498,757

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220183

Int. Cl.³ A01N *43/64, 47/24;* **C07D** *249/08;* **C07F** *1/00*

U.S. Cl. 71—76 **5 Claims**

1. Triazolyl ketone-oximes and triazolyl dioximes of the formula



I

where Ar is an aryl radical from the group consisting of biphenylyl, naphthyl and phenyl, which radical can be substituted by halogen, nitro, cyano or trifluoromethyl, by alkyl, alkoxy or alkenyl, each of not more than 5 carbon atoms, or by phenoxy, and n is 1 or 2, X is oxygen or $=N-OR^3$, R^3 being hydrogen, unsubstituted, halogen-substituted or alkoxy-substituted alkyl, alkenyl or alkynyl, each of not more than 5 carbon atoms, or benzyl which is unsubstituted or substituted by halogen, nitro, cyano or trifluoromethyl, or by alkyl or alkoxy, each of not more than 4 carbon atoms, or is $-CO-R^4$, R^4 being unsubstituted, halogen-substituted or alkoxy-substituted alkyl of not more than 5 carbon atoms, phenyl, benzyl or $-NH-R^5$, R^5 being alkyl of not more than 4 carbon atoms, R^1 is unsubstituted or alkoxy-substituted alkyl of not more than 8 carbon atoms or benzyl, chloro-benzyl, bromo-benzyl or phenylethyl, and R^2 is alkyl of not more than 8 carbon atoms or plant tolerated salts and metal complexes thereof.

5. A composition for regulating plant growth which comprises a solid or liquid carrier and an effective amount of at least one compound of the formula I of claim 1.

4,515,617

BENZYL-PYRIMIDINYLALKYL-ETHERS AS PLANT GROWTH REGULATORS AND FUNGICIDES, AND CORRESPONDING PYRIMIDINYLCARBINOLS

Graham Holmwood, Wuppertal; Klaus Lürssen, Berg.-Gladbach, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

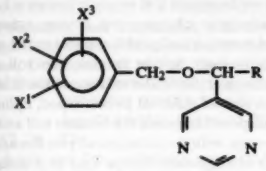
Division of Ser. No. 344,261, Jan. 28, 1982, Pat. No. 4,436,907. This application Aug. 2, 1983, Ser. No. 519,609

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105374

Int. Cl.³ A01N *43/54*

U.S. Cl. 71—76 **5 Claims**

1. A fungicidal or plant-growth stunting composition comprising a plant compatible diluent in admixture with a fungicidally or plant-growth-stunting effective amount of a benzyl-pyrimidinylalkyl-ether of the formula



in which

R is alkyl having 1 to 8 carbon atoms; cycloalkyl which has 3 to 7 carbon atoms and which is optionally substituted by alkyl having 1 to 4 carbon atoms; or phenyl which is optionally substituted by halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms and/or halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 halogen atoms,

X^1 is hydrogen, halogen, alkyl having 1 to 4 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 5 halogen atoms, halogenoalkoxy having 1 to 4 carbon atoms and 1 to 5 halogen atoms, halogenoalkylthio having 1 to 4 carbon atoms and 1 to 5 halogen atoms, phenyl which is optionally substituted by halogen and/or by alkyl having 1 to 4 carbon atoms, phenoxy which is optionally substituted by halogen and/or by alkyl having 1 to 4 carbon atoms, phenylalkyl which has 1 to 4 carbon atoms in the alkyl part and which is optionally substituted in the phenyl part by halogen and/or by alkyl having 1 to 4 carbon atoms, or phenylalkoxy which has 1 to 4 carbon atoms in the alkoxy part and which is optionally substituted in the phenyl part by halogen and/or by alkyl having 1 to 4 carbon atoms, and

X^2 and X^3 each independently is hydrogen, halogen, alkyl having 1 to 4 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms or halogenoalkyl, halogenoalkoxy or halogenoalkylthio each having 1 to 4 carbon atoms and 1 to 5 halogen atoms,

or an acid addition salt or metal salt complex thereof.

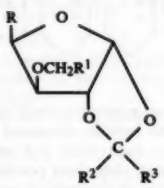
4,515,618

5-DEOXY-3-O-THIENYLMETHYL OR FURYLMETHYL-1,2-O-ALKYLIDENE-ALPHA-D-XYLOFURANOSE HERBICIDE DERIVATIVES

William Loh, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 7, 1983, Ser. No. 559,053
Int. Cl.³ A01N *43/14;* C07H *17/04*
U.S. Cl. 71—88 27 Claims

1. A compound having the formula:



(I)

wherein R is lower alkyl having 1 through 4 carbon atoms or alkenyl having 2 through 4 carbon atoms;

R^1 is thienyl, furyl, or substituted thienyl or furyl having one or two substituents selected from the group of lower alkyl having 1 through 4 carbon atoms; lower alkoxy, having 1 through 4 carbon atoms, halo, trifluoromethyl, or cyano; and

R^2 and R^3 are independently selected from the group consisting of hydrogen, lower alkyl, lower haloalkyl having 1 through 3 halo substituents, aryl having 6 through 10 carbon atoms or substituted aryl having 1 through 4 substituents independently selected from the group of lower alkyl, lower alkoxy and halo or R^2 and R^3 together with the carbon atom to which they are joined form a cycloalkyl group having 5 to 6 carbon atoms.

26. A plant growth regulating composition comprising a compatible carrier and a plant growth regulating effective amount of a compound of claim 1 and mixtures thereof.

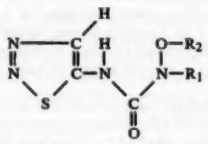
4,515,619

1,2,3-THIADIAZOLE-5-YL-UREA DERIVATIVES, AGENTS CONTAINING THESE COMPOUNDS WITH PLANT GROWTH REGULATING AND DEFOLIATING ACTIVITY

Hans-Rudolf Krüger; Friedrich Arndt, and Reinhard Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,990
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139505
Int. Cl.³ C07D *285/06;* A01N *43/82*
U.S. Cl. 71—90 30 Claims

1. A 1, 2, 3-thiadiazole-5-yl urea derivative having the formula



wherein R_1 is selected from the group consisting of phenyl, 2-chlorophenyl, 3-chlorophenyl, 4-chlorophenyl, 2-methylphenyl, 3-methylphenyl, 4-methylphenyl, 2-fluorophenyl, 2-nitrophenyl and 2-methoxyphenyl, and R_2 is a member selected from the group consisting of hydrogen, an alkali metal atom, an equivalent of a member selected from the group of calcium and magnesium atoms, methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, tert.-butyl, 2,2-dimethyl-1-propyl, n-pentyl, n-hexyl, 2-chloroethyl, 3-chloropropyl, 2-bromopropyl, 3-bromopropyl, 2-phenoxyethyl, 2-propenyl, 2-methyl-2-propenyl, 2-propinyl, benzyl, 2-chlorobenzyl, 3-chlorobenzyl, 4-chlorobenzyl, 3,4-dichlorobenzyl and the group

wherein R_3 is a member selected from the group consisting of hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, tert.-butyl, n-haphthyl, n-nonyl, n-decyl, chloromethyl, fluoromethyl, 2-chloroethyl, 1-chloroethyl, dichloromethyl, phenoxyethyl, 2-phenoxyethyl, (2,4-dichlorophenoxy)-methyl, 2-butenyl, vinyl, 2-methyl-2-propenyl, propene-1-yl, ethinyl, benzyl, 4-chlorobenzyl, cyclopropyl, cyclopentyl, cyclohexyl, methylcyclohexyl, phenyl, 3-chlorophenyl, 2-chlorophenyl, 3-methylphenyl, 4-methylphenyl, 3-nitrophenyl, 4-nitrophenyl, 2-methoxyphenyl, 4-methoxyphenyl, 1-naphthyl, 2-furyl,-methoxy, ethoxy, propoxy, isopropoxy, n-butoxy, 2-propenyloxy, 2-butenyloxy, 2-propinyloxy, phenoxy, 4-chlorophenoxy, methylthio, ethylthio, propylthio, phenylthio, 4-chlorophenylthio and an amino group

wherein R_4 and R_5 are the same or different and are each

selected from the group consisting of hydrogen, methyl, phenyl and 4-chlorophenyl.

4,515,620

TRIAZA COMPOUNDS

Beat Böhner, Binningen, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

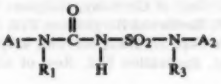
Filed Jan. 3, 1983, Ser. No. 454,950

Claims priority, application Switzerland, Jan. 12, 1982, 153/82

Int. Cl.³ C07D *239/46, 251/42, 239/47;* **A61K** *47/36*

U.S. Cl. 71—91 **11 Claims**

1. A compound selected from the group consisting of (i) a sulfamoylurea of the formula



wherein

A_1 is pyrimidin-2-yl or 1,3,5-triazin-2-yl, each of which is unsubstituted, monosubstituted in the 4-position or disubstituted in the 4- and 6-positions with the same or different substituents selected from the group consisting of halo, cyano, alkyl of 1 to 3 carbon atoms, haloalkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, haloalkoxy of 1 to 3 carbon atoms, alkylamino of 1 to 3 carbon atoms and dialkylamino of 1 to 3 carbon atoms in each alkyl group;

A_2 is phenyl, naphthyl or indanyl, each of which is unsubstituted or substituted by one or two members selected from the group consisting of halo, alkyl of 1 to 3 carbon atoms, haloalkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, haloalkoxy of 1 to 3 carbon atoms, alkylthio of 1 to 3 carbon atoms, alkoxycarbonyl of 1 to 3 carbon atoms in the alkoxy group, and nitro; and

each of R_1 and R_3 independently is hydrogen or alkyl of 1 to 4 carbon atoms; and (ii) the alkali metal, alkaline earth metal and quaternary ammonium salts thereof.

4,515,621

SHEET ROLLING MACHINE

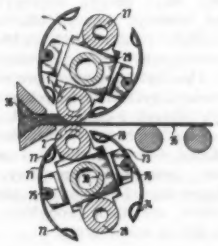
Frantz Günthner, Mainz-Lerchenberg, Fed. Rep. of Germany, assignor to JENAer Glaswerk, Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Jan. 19, 1984, Ser. No. 572,079

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302664

Int. Cl.³ C03B *13/16*

U.S. Cl. 65—171 **5 Claims**



1. A rolling machine for continuously manufacturing a strip of plastic material, the machine comprising an outlet gap and a pair of co-operating shaping rolls, one being disposed above and the other below the web of material for shaping, so that both rolls can be replaced independently, either simultaneously or successively by substitute rolls without the flow of material for shaping being interrupted or changed during the replacement, one roll and one replacement roll on each occasion being mounted on either side in a change-over device rotatable around a shaft disposed symmetrically with respect to the rolls, so that when the change-over device rotates, the roll axes move along the same imaginary cylinder surface without intersecting the plane of the web of material to be shaped, cylindrical metal plates being disposed between the bottom roll and the corresponding replacement roll(s) concentrically to the axis of rotation of the bottom change-over device and at a distance therefrom somewhat less than the distance from the axis to the most distant generatrix of the bottom roll, characterized in that the change-over device for the top roll is equipped with a device for rapidly raising and lowering the change-over device and consequently the top roll and characterized in that the cylindrical metal plates disposed between the bottom roll and the replacement roll are divided into segments mounted pivotably around a common joint so that the gap between the free ends of the segments and the roll surface can be adjusted as required.

4,515,622

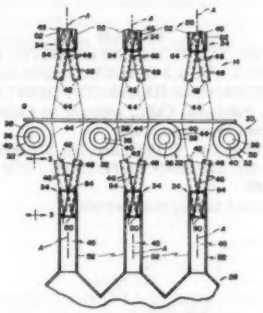
GLASS SHEET QUENCH INCLUDING OPPOSITELY ANGLED JETS

Harold A. McMaster, Woodville; Robert G. McMaster, Elmore, and Ronald A. McMaster, Woodville, all of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

Filed May 9, 1983, Ser. No. 492,687

Int. Cl.³ C03B *27/04*

U.S. Cl. 65—351 **17 Claims**



1. In a glass sheet low pressure quench including opposed blastheads each of which includes elongated plenum housings which are spaced from each other and supply pressurized quenching gas to a heated glass sheet positioned between the blastheads, the improvement comprising: each elongated plenum housing having a central plane and including a pair of planar side walls that extend parallel to the central plane thereof and to each other; an end member that extends between the planar side walls of each plenum housing; and openings positioned along the end member of each plenum housing in a spaced relationship to each other and oriented to supply jets of quenching gas angularly in both directions with respect to the central plane from the plenum housing toward the heated glass sheet for impingement therewith to cool the glass sheet.

4,515,623

CONTROL OF UNWANTED PLANT GROWTH WITH 2-ARYLOXY-2-AZOLYLALKANECARBOXAMIDES

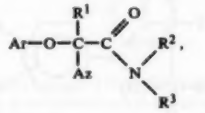
Gerd Hunslein, Bad Duerkheim; Eberhard Ammermann, Ludwigshafen; Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,402

Int. Cl.³ A01N *43/64, 43/50, 43/56*

U.S. Cl. 71—12 3 Claims

1. A process for combating unwanted plants, wherein the plants, seed or the soil are treated with a herbicidally effective amount of a compound of the formula



I

where Ar denotes unsubstituted phenyl, dichlorophenyl, trichlorophenyl, dimethychlorophenyl or trifluoromethylphenyl, R^1 denotes hydrogen or methyl, R^2 denotes hydrogen or C_1–C_{10}-alkyl, R^3 denotes C_1–C_{10}-alkyl, cyclopropyl, cyclohexyl, cyclopropylmethyl, allyl, methallyl, crotyl, 2-methylbut-2-en-1-yl, 2-methylbut-1-en-3-yl, hex-5-en-1-yl, 2-methylbut-1-en-4-yl; propargyl, but-1-yn-3-yl, but-2-yn-1-yl, 3-methylbut-1-yn-3-yl, unsubstituted or halogen-substituted benzyl and α-phenylethyl, and Az denotes unsubstituted or halogen- or methyl-substituted triazole, or a metal complex thereof.

4,515,624

HERBICIDAL SULFONAMIDES

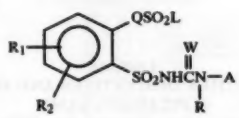
James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 23, 1983, Ser. No. 477,969

Int. Cl.³ C07D *239/42;* A01N *47/36*

U.S. Cl. 71—92 23 Claims

1. A compound of the formula:



wherein

W is O or S;

R is H or CH_3;

Q is O or NR_3;

L is NR_5R_6 or $N(OCH_3)CH_3$,

R_1 is H, F, Cl, Br, CH_3, OCH_3, CF_3 or NO_2;

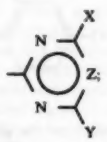
R_2 is H or Cl;

R_3 is H or C_1–C_3 alkyl;

R_5 and R_6 are independently C_1–C_3 alkyl, or R_5 and R_6 may be taken together to be $—(CH_2)_4—$, $—(CH_2)_5—$ or $—(CH_2)_2O(CH_2)_2—$;

R_7 is H, F, Cl, Br, CH_3, CF_3, NO_2 or OCH_3;

A is



A-1

X is CH_3, OCH_3, Cl, CH_2CH_3, OCH_2CH_3 or OCF_2H;

Y is H, NH_2, $NHCH_3$, $N(CH_3)_2$, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of (a) F, (b) Cl or (c) Br, CH_2OCH_3, $CH_2OCH_2CH_3$, C_1–C_4 alkoxy, C_1–C_2 alkylthio, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$, $CH(OCH_2CH_3)_2$,

OCH_2CF_3, OCH_2CH_2F, OCH_2CH_2Cl, OCH_2CH_2Br or GCF_2T wherein G is O or S and T is H, CHClF, CHBrF, CF_2H or $CHFCF_3$;

Z is CH, CCH_3, CBr, CCl, CF or CCH_2CH_3,

provided that

(1) when X is Cl, then Z is CH and Y is NH_2, $NHCH_3$, $N(CH_3)_2$, CH_3, OCH_3 or OCF_2H;

(2) when W is S, then R is H; and their agriculturally suitable salts.

4,515,625

BENZAMIDES, COMPOSITIONS AND AGRICULTURAL METHOD

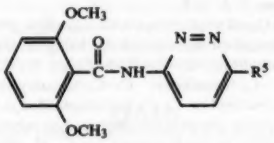
Kenneth W. Burow, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 302,323, Sep. 14, 1981, Pat. No. 4,416,683, which is a continuation-in-part of Ser. No. 187,675, Sep. 16, 1980, abandoned. This application Jul. 5, 1983, Ser. No. 510,699

Int. Cl.³ A01N *43/58*

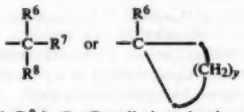
U.S. Cl. 71—92 10 Claims

1. A herbicidal composition comprising an effective amount of a benzamide herbicide of the formula



I

wherein R^5 is



or C_1–C_4 alkyl, R^8 is C_1–C_{13} alkyl, and y is an integer from zero to four, and the agronomically acceptable salts thereof, admixed with an agronomically-acceptable carrier, diluent, or adjuvant therefor.

4,515,626

N-(CYCLOPROPYL-TRIAZINYL-N'-(ARYLSULFONYL) UREAS HAVING HERBICIDAL ACTIVITY

Henry Szczepanski, Wallbach, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

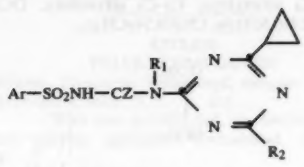
Filed Sep. 26, 1983, Ser. No. 535,527

Claims priority, application Switzerland, Oct. 6, 1982, 5874/82

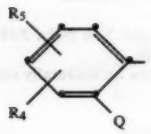
Int. Cl.³ C07D *251/18, 251/42, 251/16;* A01N *43/66*

U.S. Cl. 71—93 13 Claims

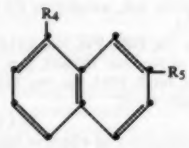
1. An N-(cyclopropyl-triazinyl-)-N'-(arylsulfonyl)urea of the formula I



wherein Ar is a phenyl group



or a
naphthyl group



and

Q is a group X-A or R_3,

A is a C_3–C_6-alkynyl group, a C_1–C_6-alkyl group which is unsubstituted or substituted by halogen, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, C_1–C_4-haloalkoxy, C_1–C_4-haloalkylthio, C_1–C_4-haloalkylsulfinyl or C_1–C_4-haloalkylsulfonyl, or a C_2–C_6-alkenyl group which is unsubstituted or substituted by the groups given in the foregoing for C_1–C_6-alkyl, or A is a phenyl or benzyl group,

X is oxygen, sulfur, or a sulfinyl or sulfonyl bridge,

Z is oxygen or sulfur,

R_1 is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_2 is halogen, C_1–C_3-alkyl, C_1–C_3-haloalkyl, C_1–C_3-alkoxy, C_1–C_3-haloalkoxy, amino, C_1–C_3-alkylamino, di-(C_1–C_3-alkyl)amino, C_3–C_6-cycloalkyl or C_2–C_6-alkoxyalkyl,

R_3 is hydrogen, halogen, C_1–C_5-alkyl, C_2–C_5-alkenyl, C_1–C_4-haloalkyl, or a group —X—R_6, —$COZR_{11}$, —NO_2 or —CO—NR_8R_9, —CN, —COR_{10}, —NR_1R_7 or —NR_1—COR_{12},

R_4 is hydrogen; C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, halogen, or alkoxyalkyl having at most 4 carbon atoms,

R_5 is the same as R_3 but independent thereof,

R_6 and R_7 are each C_1–C_5-alkyl, C_2–C_5-alkenyl or C_2–C_6-alkynyl,

R_8 and R_9 independently of one another are each hydrogen, C_1–C_5-alkyl, C_2–C_5-alkenyl or C_2–C_6-alkynyl,

R_{10} is hydrogen, C_1–C_4-alkyl or C_1–C_3-haloalkyl,

R_{11} is hydrogen, C_1–C_4-alkyl, C_1–C_3-haloalkyl, C_3–C_5-alkenyl, C_3–C_5-alkynyl, phenyl or benzyl, and

R_{12} is the same as R_1 but independent thereof.

9. A herbicidal and plant-growth-reducing composition which contains, as active ingredient, an effective amount of an N-phenylsulfonyl-N′-triazinyl-urea according to claim 1, together with a carrier.

4,515,627

DICHLORO ETHYL BENZYL ACETAMIDE HERBICIDE ANTIDOTE

Laddie L. Green, San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 335,788, Dec. 30, 1981, abandoned. This application Apr. 19, 1983, Ser. No. 486,606

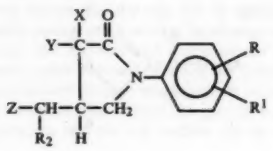
Int. Cl.³ A01N *43/36, 37/18*

U.S. Cl. 71—95 **4 Claims**

1. A composition comprising:

(a) an herbicidally effective amount of a pyrrolidone compound of the formula

(I)



in which

X is hydrogen;

Y is chlorine or bromine;

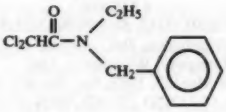
Z is chlorine or bromine;

R is hydrogen, chlorine, bromine, fluorine, or iodine;

R_1 is trifluoromethyl; and

R_2 is hydrogen; and

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



4,515,628

DIPHENYL ETHER DERIVATIVES AND HERBICIDES CONTAINING SAME

Takeo Yoshimoto; Akira Hosono; Joh Miki; Kengo Oda; Masaaki Ura; Naoki Sato; Teruhiko Toyama; Hajime Tachibana; Yuji Enomoto; Yasunobu Funakoshi; Takashi Fujita, and Yoshikata Hojo, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 91,858, Nov. 6, 1979, abandoned. This application Jul. 28, 1981, Ser. No. 287,654

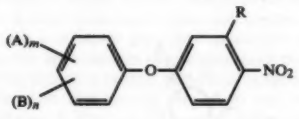
Claims priority, application Japan, Nov. 8, 1978, 53-136769

Int. Cl.³ A01N *37/48*; C07C *79/46*

U.S. Cl. 71—111 **19 Claims**

1. A diphenyl ether compound represented by the general formula I.

(I)

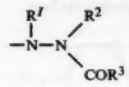


wherein;

A and B are each selected from the group consisting of a chlorine atom, a fluorine atom, —CH_3 and —CF_3;

m and n each represent an integer 0—3 and m+n=0—3;

R represents

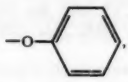


wherein;

R^1 represents hydrogen atom, $-CH_3$, $-C_2H_5$ or $-C_3H_7(n)$;

R^2 represents hydrogen atom, $-CH_3$ or $-C_2H_5$;

R^3 represents an alkoxy group having 1 to 4 carbon atoms,



a carboxyalkyl group, a carbalkoxy group, a carboxyalkenyl group, a carbalkoxy-alkyl group or a carbalkoxyalkenyl group.

4,515,629

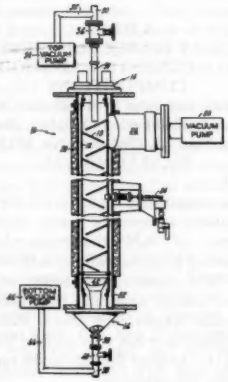
DEGASSING METAL POWDER

Frederick A. Dizek, Westfield, Mass.; Eric S. Vogel, Manchester, Conn.; C. John Tiedeman, Jr., East Hartford, Conn., and Robert A. Herold, Tolland, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1981, Ser. No. 233,726

Int. Cl.³ C21D *1/00*

U.S. Cl. 75—0.5 B **2 Claims**



1. The method of degassing a metal powder in an enclosed vertical shell containing a plurality of opposing inclined baffle plates fixed to the shell and positioned to cause powder to drop alternately in a downward direction from one baffle plate to the next along the vertical length of a region of the shell, characterized by measuring the static angle of repose of the the powder with respect to a horizontal and fixing the incline of the baffle plates at an angle with respect to the horizontal which is less than said static angle of repose; evacuating said region and heating said region to at least 500° F.; vibrating said region and the baffle plates contained therein to control the rate of powder flow across the baffles and along the said vertical length; and collecting the powder at the bottom of the shell.

4,515,630

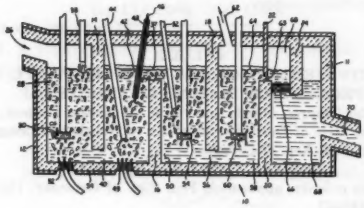
PROCESS OF CONTINUOUSLY TREATING AN ALLOY MELT

Derek E. Tyler, Cheshire, and John C. Yarwood, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 15, 1983, Ser. No. 523,328

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—53 **16 Claims**



1. A process of continuously treating an alloy melt comprising the steps of:

a. transferring said melt through a plurality of interconnected treatment zones;

b. decarburizing said melt to between about 0.5% to about 0.001% of the alloy melt in a first treatment zone;

c. deoxidizing the decarburized melt to lower the oxygen content of said melt to less than about 0.01% by adding a deoxidizing agent to said melt in a second treatment zone;

d. desulfurizing the deoxidized melt to lower the sulfur content of said melt to less than about 0.01% by adding active sulfide forming agents to said melt in a third treatment zone;

e. degassing said desulfurized melt to lower the gas content of said melt to less than about 0.0005% H_2 by flushing said melt with a gas in a fourth treatment zone; and

f. removing particulates and films from said melt by filtering the degassed melt in a fifth treatment zone.

4,515,631

METHOD FOR PRODUCING BLISTER COPPER

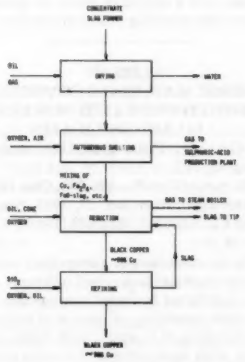
Björn K. V. Lindquist, and Stig A. Petersson, both of Skellefteham, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Feb. 16, 1984, Ser. No. 580,614

Claims priority, application Sweden, Mar. 4, 1983, 8301187

Int. Cl.³ C22B *15/06*

U.S. Cl. 75—73 **4 Claims**



1. A method for producing blister copper from copper-iron

sulphide concentrates, including concentrates whose sulphur contents are insufficient to autogenously smelt the concentrate to matte, characterized by autogenously smelting the concentrate, together with a slag former which contributes to forming a slag phase, with oxygen gas or air rich in oxygen in a top-blown rotary converter, to form a mixture of a black copper phase, magnetite and fayalite slag; subsequently charging a reductant to the furnace for the reduction of formed magnetite while supplying heat; separating the flag formed from the resultant copper metal phase; and by refining the copper metal phase to blister copper.

4,515,632

ACTIVATED AMMONIUM POLYPHOSPHATE, A PROCESS FOR MAKING IT, AND ITS USE

Alexander Maurer, Hürth, and Horst Staendeke, Lohmar, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,131

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238443

Int. Cl.³ C09D *5/18*

U.S. Cl. 106—18.16 **5 Claims**

1. Ammonium polyphosphate adapted to undergo decomposition at an increased rate at temperatures within the range 300° to 600° C., the ammonium polyphosphate having been obtained by subjecting a long chain ammonium polyphosphate with a mean chain length of 100 to 1000 and melamine or dicyandiamide or mixtures or derivatives thereof to tempering treatment with intensive agitation at 100° to 200° C. over a period of 10 minutes to 2 hours.

4. A process for improving the 300°–600° C. decomposition rate of an ammonium polyphosphate, said ammonium polyphosphate having a mean chain length of about 100 to 1000 and being a compound of the formula

$$H_{(n-m)}(NH_4)_mP_nO_{3n+1}$$

in which m/n is at least about 0.7 but m is less than n+2, so that a minor amount of acid groups, relative to the amount of NH_4 groups, are available, said process comprising:

reacting a minor amount of melamine or dicyandiamide or their derivatives which are thermally stable up to a temperature of about 220° C., or mixtures thereof, with said ammonium polyphosphate, whereby the melamine or dicyandiamide or derivative thereof becomes superficially fixed to acid groups on the surface of said ammonium polyphosphate, thereby obtaining a reaction product with said improved decomposition rate but essentially without apparent increase in the water soluble proportion of said reaction product, said reaction being effected with continuous thorough mixing at a temperature of about 100° to 200° C. and over a period of about 10 minutes to 2 hours, and cooling the resulting reaction product.

4,515,633

POLYMERIC MATERIALS COMBINED WITH MODIFIED HYDRATED MAGNESIUM ALUMINOSILICATES

Mamerto M. Cruz, Jr., Pennington, N.J., assignor to Morca, Inc., Pennington, N.J.

Continuation-in-part of Ser. No. 196,308, Oct. 14, 1980, Pat. No. 4,400,297. This application Jun. 27, 1983, Ser. No. 507,723

Int. Cl.³ C09D *5/16;* **C08L** *89/00, 1/00*

U.S. Cl. 106—18.26 **20 Claims**

1. An article of manufacture comprising a natural or synthetic polymeric material and a self adherent aqueous acidic modified, heat exfoliated hydrated magnesium aluminosilicate in particulate form consisting of groups of non-colloidal platelets capable of hydrogen bonding with hydrophilic materials and compatible with hydrophobic polymers and being further characterized in forming slurries in aqueous media, the slurries being non-sensitive to electrolytes and in forming separable, coherent, continuous sheets upon drying of the slurries in contact with a hydrophobic surface.

4,515,634

CASTABLE GLASS-CERAMIC COMPOSITION USEFUL AS DENTAL RESTORATIVE

Jenn-Ming Wu, Tainan, Taiwan; Warren R. Cannon, East Brunswick, and Carlino Panzera, Belle Mead, both of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Oct. 17, 1983, Ser. No. 542,798

Int. Cl.³ C03C *3/22;* **C09K** *3/00*

U.S. Cl. 106—35 **4 Claims**

1. A glass-ceramic having high strength and a high softening temperature, consisting essentially of the following constituents, on a mole percent basis:

Li_2O	28.5–30.5
SiO_2	57–62
Al_2O_3	1–2
CaO	5–7
P_2O_5	1–2.5
TiO_2	0.5–1.5
ZrO_2	0.5–1.5

wherein the crystalline phase is lithium disilicate, said glass ceramic having a flexural strength of from about 40,000 psi to about 52,000 psi, and a softening temperature of from about 750° C. to about 825° C.

2. A dental restoration comprising the glass-ceramic of claim 1.

4,515,635

HYDROLYTICALLY STABLE POLYMERS FOR USE IN OIL FIELD CEMENTING METHODS AND COMPOSITIONS

S. Prabhakara Rao, and John F. Burkhalter, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 23, 1984, Ser. No. 592,989

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **10 Claims**

1. A cementing composition for use in oil, gas and water well cementing operations comprising water, hydraulic cement, and a copolymer of N,N, dimethylacrylamide and 2-acrylamido, 2-methyl propane sulfonic acid wherein said copolymer has a N,N, dimethylacrylamide to 2-acrylamido, 2-methyl propane sulfonic acid ratio from about 1:4 to about 4:1 and a molecular weight such that a 1000 ppm aqueous solution of said copolymer has a Brookfield viscosity reading at 5 rpm of the U.L. Adapter Spindle in the range of between about 30 and about 250 centipoise.

4,515,636

REINFORCED CEMENT

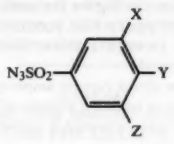
Thomas E. Carney; Allan R. Champion, both of Wilmington, and Francis M. Logullo, Sr., Hockessin, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 17, 1984, Ser. No. 641,860

Int. Cl.³ C04B *7/02, 7/35*

U.S. Cl. 106—90 **7 Claims**

1. A fiber-cement product comprising a cement matrix reinforced with fibers selected from the group consisting of p-aramid and acrylic fiber, said fiber being coated with a sulfonyl azide of the formula



where X, Y and Z, which may be the same or different, are selected from the group consisting of hydrogen, carboxyl and hydroxyl, with the proviso that at least one but not all of X, Y and Z is hydrogen, said coating being in an amount sufficient to improve adhesion of the fiber to the cement matrix.

4,515,637

COLLAGEN-THROMBIN COMPOSITIONS

Gheorghe Cioca, Coatesville, Pa., assignor to Seton Company, Newark, N.J.

Filed Nov. 16, 1983, Ser. No. 552,110

Int. Cl.³ C08L *89/06;* **A61K** *35/14;* **C08H** *1/06*

U.S. Cl. 424—94 **10 Claims**

1. A method of forming a collagen-thrombin hemostatic composition consisting essentially of:

forming a homogeneous aqueous admixture of collagen and thrombin at a basic pH, wherein the ratio of collagen to thrombin is about 0.1 gram of collagen to about 300 units or greater of thrombin; and

lyophilizing said collagen-thrombin admixture to form a stable collagen sponge having thrombin distributed uniformly throughout and wherein said collagen is absorbable when placed in vivo.

4,515,638

STABILIZATION OF THE B-SIDE

Richard B. Kennedy, Ridgefield, Conn., assignor to Richard J. Fricke and Patrick J. Crehan, both of Ridgefield, Conn.

Filed Jul. 26, 1984, Ser. No. 634,786

Int. Cl.³ C08G *18/14*

U.S. Cl. 106—162 **15 Claims**

1. A mixture useful for the preparation of polyurethane foams comprising an untreated carbohydrate in which substantially all of the hydroxyl groups are free, water, and a polyurethane producing amine catalyst, the pH of said mixture being at least 9 because of the presence of an alkaline reagent.

4,515,639

AZO PIGMENT FORMULATIONS

Peter Dopfer, Frankfurt am Main; Johann Ostermeier, and Siegfried Schwerin, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,143

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104257

Int. Cl.³ C09B *67/00, 67/20, 67/42;* **C09D** *11/02*

U.S. Cl. 106—288 Q **1 Claim**

1. An azo pigment formulation which contains a long-chain aliphatic primary amine selected from the group consisting of coconut fatty amine, oleylamine, stearylamine, tallow fatty amine and diamines of the formula

$$\text{alkyl—NH—CH}_2\text{—CH}_2\text{—CH}_2\text{—NH}_2$$

wherein said alkyl is of from 14 to 18 carbon atoms, and a diamine of the formula

$$\text{H}_2\text{N—A—N—H}_2$$

in which A is an aliphatic or cycloaliphatic hydrocarbon radical of from 6 to 30 carbon atoms free from acetylenic linkages.

4,515,640

FLUOROALIPHATIC-THIO,-SULFINYL, OR SULFONYL SUBSTITUTED BICYCLOALIPHATIC AMIC ACID AMINE SALTS, AND COMPOSITIONS AND USE THEREOF

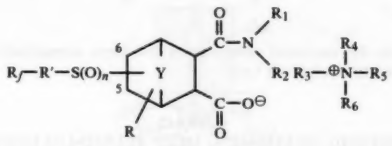
Jürgen Kaschig, Freiburg, Fed. Rep. of Germany; Eduard K. Kleiner, Pound Ridge, N.Y.; Karl F. Mueller, New York, N.Y., and Thomas W. Cooke, Mahopac, N.Y., assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,435

Int. Cl.³ C09K *3/00;* **C08K** *5/35*

U.S. Cl. 106—287.25 **18 Claims**

1. A fluoroaliphatic substituted bicycloaliphatic amic acid amine salt of the formula



(I)

wherein

R_f is straight or branched chain perfluoroalkyl of 4 to 18 carbon atoms or perfluoroalkoxy-perfluoroalkyl of 4 to 18 carbon atoms;

R' is straight or branched chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms, a alkyleneiminoalkylene of 2 to 12 carbon atoms where the imino nitrogen atom contains as a third substitutent, hydrogen or alkyl of 1 to 6 carbon atoms;

n is 0, 1 or 2;

Y is lower alkylene or —O—;

R_1 and R_2 are independently hydrogen, lower alkyl, hydroxy-lower alkyl, or together with the nitrogen to which they are attached, represent morpholino;

R_3, R_4 and R_5 independently represent hydrogen, lower alkyl, or hydroxy-lower alkyl,

R_6 is lower alkyl, benzyl, lower alkyl substituted by hydroxy, carboxy or sulfo, or together with R_5 and the nitrogen to which they are attached represent morpholino;

R is hydrogen or methyl; and

wherein the R_f—R'—S(O)$_n$— group is in the 5- or 6-position.

4,515,641

CLEANING CONTROL THROUGH MEASUREMENT OF ELECTRICAL CONDUCTIVITY

Rüdolf Juenger, Kreuzau, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jun. 21, 1983, Ser. No. 506,496

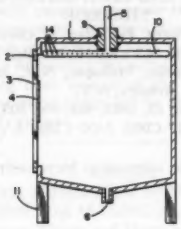
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1982, 3224016

Int. Cl.³ B08B *7/04, 9/00, 9/02*

U.S. Cl. 134—5 **10 Claims**

1. A process for cleaning the interior wall of a contaminated metal vessel or pipe comprising flooding or turbulently impacting the interior wall of said vessel or pipe with a strongly alkaline or strongly acidic cleaning fluid, simultaneously measuring the conductivity of the cleaning fluid between two electrodes located in the interior of said vessel or pipe, said electrodes being electrically insulated and separated from each other and with at least one of said electrodes having been

subjected to contamination while located in the interior of said vessel or pipe, and terminating said flooding or impacting



when the measured conductivity has been substantially restored to a reference level.

4,515,642

METHOD OF FORMING DEEP ALUMINUM DOPED SILICON BY IMPLANTING AL AND SI IONS THROUGH ALUMINA LAYER AND DEVICE FORMED THEREBY

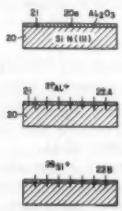
Takashi Ajima, Kamakura; Jiro Ohshima, Kawasaki, and Yutaka Koshino, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 22, 1983, Ser. No. 525,484

Claims priority, application Japan, Aug. 23, 1982, 57-145980

Int. Cl.³ H01L *17/00*

U.S. Cl. 148—1.5 **8 Claims**



1. A method of producing a semiconductor device comprising the steps of:

forming an alumina layer directly on a principal surface of a silicon substrate;

ion-implanting aluminum through said alumina layer into said substrate;

ion-implanting silicon through said alumina layer into said substrate; and

annealing said substrate into which aluminum and silicon have been ion-implanted.

4,515,643

METHOD FOR DETERMINING AND ADJUSTING THE POTENCY AND EFFECTIVENESS OF A METAL PHOSPHATE CONVERSION COATING PROCESS

Mark Knaster, Ambler, Pa., assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 436,481

Int. Cl.³ C23F *7/08, 7/10, 7/12*

U.S. Cl. 148—6.15 Z **5 Claims**

1. A method for determining and adjusting the potency and effectiveness of a metal phosphate conversion coating solution comprising the steps of

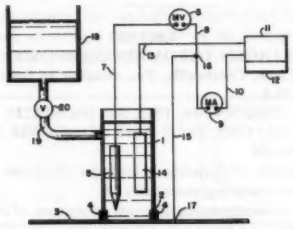
(A) forming a phosphate conversion coating on a metal substrate by contacting the metal substrate with said phosphate conversion coating solution;

(B) determining the crystallinity and thickness of the phosphate conversion coating on the metal substrate by

a. measuring the steady state potential of the coated surface thereof through a dilute electrolyte solution in contact therewith;

b. measuring the direct current amperage obtained when a small positive or negative voltage differential compared to the steady state potential is applied to the electrolyte solution;

c. measuring the direct current amperage obtained when a small voltage differential compared to the steady state potential opposite to that employed in step b. is applied to the electrolyte solution; and



d. comparing the measurement results obtained in a., b. and c. with the corresponding results obtained from use of the above identified method with a similar coated surface from a conversion coating solution of known potency;

e. where one or more of said compared measurements are different from the measurement obtained with said similar coated surface, then adjusting the composition of the phosphate conversion coating solution as need based on the results obtained in step (B) d.

2. A method in accordance with claim 1 wherein the conversion coating solution contains both zinc ions and phosphate ions.

4,515,644

METHOD FOR PRODUCING FERRITIC STAINLESS STEEL SHEETS OR STRIPS CONTAINING ALUMINUM

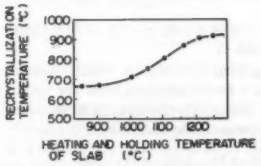
Tadashi Sawatani, Tokyo; Mitsuo Ishii, Hikari; Hirofumi Yoshimura, and Jirou Harase, both of Munakata, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Oct. 19, 1981, Ser. No. 312,848

Claims priority, application Japan, Oct. 21, 1980, 55-146377; Oct. 21, 1980, 55-146378

Int. Cl.³ C21D *8/04*

U.S. Cl. 148—12 EA **13 Claims**



1. A method for producing ferritic stainless steel sheets or strips with reduced ridging, which comprises:

heating a slab of a ferritic stainless steel containing up to 0.2% of Al, the Al content being at least twice the N content, at a temperature of not more than 1200° C., and, then,

hot rolling said slab of ferritic stainless steel at at least one pass of screw down at a draft of not less than 20% pass, whereby precipitation of AlN and partial recrystallization of said ferritic stainless steel occurs.

4,515,645

PROCEDURE FOR BRIGHT ANNEALING OF METALLIC WORK PIECES USING NITROGEN AS PROTECTIVE GAS

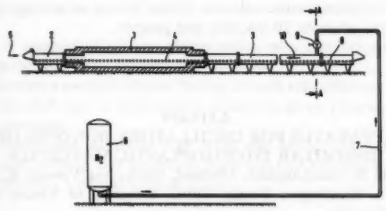
Gottfried Böhm, Mühlheim-Ruhr, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,748

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234863

Int. Cl.³ C21D *1/62*

U.S. Cl. 148—16 **2 Claims**



1. In a process for bright annealing of metallic work pieces in a bright annealing furnace with subsequent cooling line and using nitrogen as protective gas, the improvement being spraying the nitrogen in liquid form onto the material to be annealed in the exit end zone of the cooling line.

4,515,646

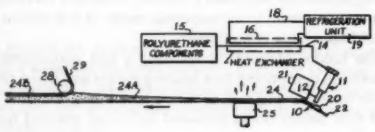
METHOD FOR APPLYING POLYURETHANE BACKING

Paul Walker, 2606 W. Lake Park, Rocky Face, Ga. 30740; Glen F. Hamrick, 3200 Summer Rd., Tunnel Hill, Ga. 30755, and B. Lamar Sosebee, Resaca, Ga., assignors to Paul Walker, Rocky Face and Glen F. Hamrick, Tunnel Hill, both of, Ga.

Filed Nov. 22, 1983, Ser. No. 554,210

Int. Cl.³ B05D *3/10, 5/00*

U.S. Cl. 156—78 **17 Claims**



1. A method for forming a blown polyurethane coating on porous sheet material, said polyurethane coating being formed by reaction of urethane forming components including at least a polyol, an isocyanate and water, said reaction requiring heat for initiation, said method including the steps of cooling said components to a temperature substantially below the temperature for initiation of the reaction, preparing a formulation of said urethane forming components having an excess of the isocyanate relative to the water compared to the desired coating formulation to provide a liquid mix, placing a quantity of said liquid mix on said porous sheet material in a puddle, leveling said puddle to provide a uniform coating of said liquid mix on said porous sheet material, passing steam through said sheet material and into said uniform coating for adding water to said liquid mix for reaction with said excess of isocyanate and for heating said liquid mix to start said reaction.

4,515,647

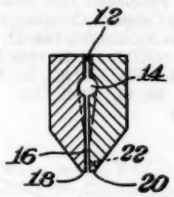
METHOD AND APPARATUS FOR FORMING AN INTEGRAL CLOSURE FOR A THERMOPLASTIC CONTAINER

Raymond D. Behr, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 464,828, Feb. 8, 1983, abandoned, which is a continuation of Ser. No. 255,007, Apr. 17, 1981, abandoned. This application Mar. 5, 1984, Ser. No. 586,163

Int. Cl.³ B32B *7/04*

U.S. Cl. 156—91 **5 Claims**



1. A method for forming an integral thermoplastic fastener element on a mainstream thermoplastic film or sheet extruded from a cast die having die lips at its exit, said method comprising the steps of extruding said film or sheet through said die lips, extruding at least one fastening element and a profile base in said die in open communication with said film and sheet, and width of said mainstream of thermoplastic film or sheet being several times wider than said fastener element, whereby said profile base with said fastener element is joined with said film or sheet before the same leaves the die lips, and cooling said joined film or sheet and fastener element outside the die lips.

4,515,648

METHOD OF MAKING A GASTIGHT MULTIPLE-WALLED PLASTIC PANEL

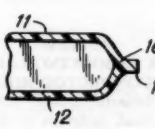
Klaus Kolbe, Reinheim; Walter Hellmann; Otmar Krajec, both of Rossdorf; Hartmut Schikowsky, Darmstadt, and Heinz Vetter, Rossdorf, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 15, 1982, Ser. No. 450,016

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 8137938[U]

Int. Cl.³ B29D *23/04*; B32B *31/02*

U.S. Cl. 156—196 **14 Claims**



1. A method of making a gastight multiple-walled panel, formed from a synthetic resin, which method comprises the steps of:

(a) heating a portion of a multiple-walled panel formed from a synthetic resin, said panel having at least two substantially parallel outer walls and at least two partition walls disposed transversely thereto to form a hollow cell, at least to a temperature at which the resin in said heated panel portion is in a thermplastic state;

(b) joining the outer walls of said heated panel portion to form a gastight seal;

(c) maintaining said heated panel portion comprising said gastight seal at a temperature in the range from about 10° C. below to about 70° C. above the Vicat softening temperature of said resin, said panel being heated for a period

of at least one minute at higher temperatures within this range to about 15 minutes or more at lower temperatures in this range until internal stresses in the region of said gastight seal are relieved; and then

(d) cooling the heated panel portion and gastight seal therein to room temperature, whereby a panel free of cracks in the region of the gastight seal is obtained

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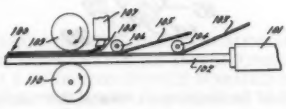
4,515,649
THERMOPLASTIC ELASTOMER MOLDING

Joel H. Nussbaum, Farmington Hill, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Continuation of Ser. No. 350,762, Feb. 22, 1982, abandoned, Division of Ser. No. 169,772, Jul. 17, 1980, Pat. No. 4,349,592. This application Aug. 24, 1983, Ser. No. 525,806

Int. Cl.³ B29D *7/02*

U.S. Cl. 156—244.11 **7 Claims**



1. The method of making a laminate construction, said method comprising the steps of:

laminating a first sheet of a first material to a second sheet of a second material to form a tie sheet using sheet lamination techniques, said sheet lamination techniques including pressing said first and second sheets together with adhesive means therebetween;

extrusion laminating with heat a first body comprising a thermoplastic elastomer material onto said first sheet, said thermoplastic elastomer material being compatible for lamination with said first material of said first sheet without the use of adhesives;

extrusion laminating with heat a second body comprising a second thermoplastic onto said second sheet, said second thermoplastic being compatible for lamination with said second material without the use of adhesives and being incompatible for lamination with said thermoplastic elastomer material by said extrusion lamination with heat, at least one of said first and second bodies being substantially thicker than either of said first or second sheets.

4,515,650
METHOD FOR PRODUCING LARGE GRAINED SEMICONDUCTOR RIBBONS

Praveen Chaudhari, Briarcliff Manor, N.Y., and René Müller, Fislisbach, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 150,257, May 15, 1980, abandoned. This application Dec. 31, 1981, Ser. No. 336,486

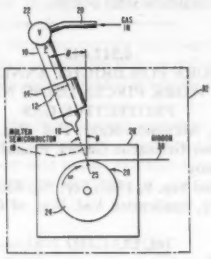
Int. Cl.³ C30B *19/00*

U.S. Cl. 156—622 **7 Claims**

1. In a method for fabricating a ribbon of semiconductor material wherein the semiconductor material in a molten state is discharged as a stream onto the cylindrical surface of only one rotating cylinder comprised of conducting material to form said ribbon by ribbon casting from said cylindrical surface, the improvement comprising:

discharging said material at an angle of incidence with respect to said cylindrical surface to a point of contact on said surface such that there is a component of said stream in the direction of a tangent to said cylinder at said surface in the direction of rotation thereof, and

rotating said cylinder at a surface linear velocity in the range of about 8 meters/sec to about 36 meters/sec to obtain



crystalline semiconductor ribbon having an average grain size of about 20 microns and greater.

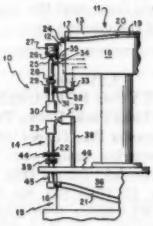
4,515,651
APPARATUS FOR OSCILLATORY BONDING OF DISSIMILAR THERMOPLASTIC MATERIALS

Donald N. MacLaughlin, Midland, Mich., and Vincent E. Fortuna, Huntington Beach, Calif., assignors to Vercon Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 371,363, Apr. 23, 1982, Pat. No. 4,462,849. This application Aug. 27, 1984, Ser. No. 644,189

Int. Cl.³ B29C *27/08*

U.S. Cl. 156—423 **20 Claims**



1. Apparatus for oscillatory friction welding a thermoplastic polymer component to a component made of a dissimilar material, said apparatus comprising:

a first holder adapted for securing a first component to be welded, comprising first holding means and a first receptacle for receiving said first component;

said first holder being mounted on a tool adapted for axial sliding movement;

said tool being mounted on a carrier assembly;

oscillator means connected to said first tool and said carrier assembly and arranged to oscillate said first tool axially with respect to said carrier assembly;

a second holder secured to a spindle mount and adapted for holding a second article to be welded to said first article, said second holder being axially aligned with said first holder in close proximity thereto, and comprising a receptacle for receiving said second article;

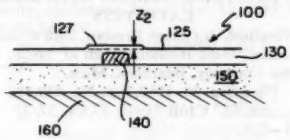
means for moving said first and second holders in axially reciprocating movement toward and away from each other; and

an external heat generator mounted in close proximity to at least one of said holders and arranged to direct heat against a welding surface of a component held in said close proximity holder.

4,515,652
PLASMA SCULPTURING WITH A NON-PLANAR SACRIFICIAL LAYER

George E. Gimpelson, Indialantic, and Cheryl L. Russo, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 20, 1984, Ser. No. 591,597
Int. Cl.[3] B44C 1/22; C03C 15/00, 25/06; B29C 17/08
U.S. Cl. 156—643 19 Claims

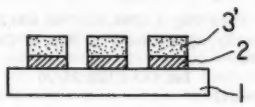


1. A method of plasma planarization of a topographically rough surface layer comprising:
selecting a sacrificial layer having an etch rate different from the etch rate of said surface layer in a given plasma environment;
applying said sacrificial layer over said surface layer; and
plasma etching said sacrificial layer and said surface layer to produce a planar surface layer.

4,515,653
METHOD FOR PRODUCTION OF A MOISTURE SENSOR

Hisatoshi Furubayashi, Yamatokoriyama; Junichi Tanaka; Masanori Watanabe, both of Tenri, and Masaya Hijikigawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 27, 1984, Ser. No. 604,386
Claims priority, application Japan, Apr. 30, 1983, 58-77807; May 7, 1983, 58-79731
Int. Cl.[3] B44C 1/22; C03C 15/00, 25/06; B29C 17/08
U.S. Cl. 156—643 6 Claims



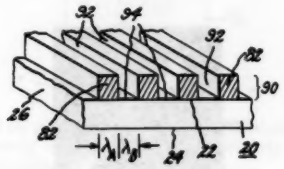
1. A method for production of a moisture sensor comprising forming a moisture sensitive polymer film on a substrate, disposing a patterned masking material on said moisture sensitive polymer film, and etching said moisture sensitive film by means of an oxygen plasma.

4,515,654
METHOD FOR MAKING SEMICONDUCTOR DEVICES UTILIZING EUTECTIC MASKS

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 395,761, Jul. 6, 1982,. This application May 25, 1984, Ser. No. 614,173
Int. Cl.[3] C23F 1/02; H01L 7/44; B44C 1/22; C03C 15/00
U.S. Cl. 156—656 25 Claims

1. A method for making self aligned doped regions in a body of semiconductor material comprising the steps of:
(a) providing a body of semiconductor material suitable for the manufacture of semiconductor devices, said body having substantially parallel upper and lower major surfaces and a peripheral edge area interconnecting said major surfaces;
(b) forming a thin film lamellar metallic eutectic on at least a portion of said upper major surface of said body;
(c) selectively removing one of the lamellar phases of said thin film lamellar metallic eutectic, forming thereby a spaced array of substantially parallel metallic elements of the remaining phase with substantially parallel spaces in-between said elements and exposing thereby segments

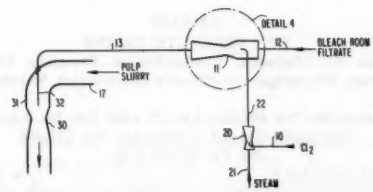


of said upper major surface beneath the selectively removed phase and in-between said elements; and
(d) forming at least first doped regions directly beneath the exposed segments of said upper major surface in-between said elements by introducing a first concentration of atoms of a first impurity type through the exposed segments of said upper major surface in-between said elements.

4,515,655
METHOD OF BLEACHING PAPER PULP BY BLENDING CHLORINE WITH A FLOW VOLUME OF PAPER PULP SLURRY

Ernst H. Schaefer, Darien, Conn., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 522,793
Int. Cl.[3] B01F 3/04; D21C 9/12
U.S. Cl. 162—57 1 Claim

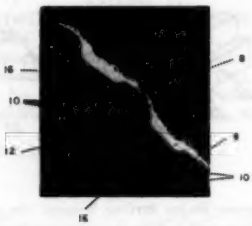


1. A method of bleaching paper pulp by blending chlorine with a flow volume of paper pulp slurry comprising the steps of:
A. combining a predetermined flow rate of chlorine gas with an approximately four times greater volumetric flow rate of steam to provide a mixed gas flow stream;
B. entraining a liquid phase carrier flow stream comprising approximately one third of the pulp slurry flow volume with bubbles formed from said mixed gas flow stream;
C. condensing the steam constituent of each bubble within said carrier stream to leave a substantially pure chlorine gas bubble of reduced volume;
D. releasing the reduced volume bubble entrained carrier stream with the center of said paper pulp slurry flow volume at a velocity of two to eight times greater than the flow velocity of said slurry flow volume to distribute the bubbles throughout the slurry by shear induced turbulence; and,
E. reacting the chlorine with the pulp slurry to bleach the paper pulp.

4,515,656
LOW DENSITY NONWOVEN SHEETS

Wesley Memeger, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 297,271, Aug. 28, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 406,543
Int. Cl.³ D21F *11/00*
U.S. Cl. 162—101 35 Claims



1. Process for preparing a coherent expanded adhesive-free wet laid nonwoven sheet comprised of fibrids of a wholly synthetic polymer and optionally up to 80% by weight floc, the sheet having an apparent density of less than 0.16 g/mL and being comprised of a plurality of paper-like layers of membranous elements which join and separate at random throughout the thickness of the sheet to form expanded macroscopic cells, the expanded sheet further comprising up to 50%, based on the total area of the sheet, of discrete areas which are not expanded, the process comprising preparing a wet mixture of fibrids of a wholly synthetic polymer, and optionally up to 80% by weight floc, forming a wet-laid nonwoven sheet of the fibrids on paper-forming equipment, maintaining water in the sheet, adding additional water if needed to increase the water content of the sheet to at least 60% by weight, and heating the wet sheet under such pressure and for such time to vaporize the water rapidly and, simultaneously, to expand the wet-laid nonwoven sheet to provide the aforesaid expanded sheet.

4,515,657
WET STRENGTH RESINS

William W. Maslanka, London-Britain Township, Chester County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 488,893, Apr. 27, 1983, Pat. No. 4,487,884. This application Jul. 2, 1984, Ser. No. 627,258
Int. Cl.³ D21H *3/48*
U.S. Cl. 162—164.3 4 Claims

1. A paper product having wet and dry strength and improved repulpability comprising sheeted cellulose fibers treated with from about 0.2 to about 3% by weight, based on dry weight of fibers, of a water-soluble, cationic thermosetting resin derived by reacting N-bis(aminopropyl)-methylamine saturated dicarboxylic acid component comprising oxalic acid to form a polyaminopolyamide containing tertiary amine groups, the mole ratio of N-bis(aminopropyl)-methylamine to the acid component being from about 0.9:1 to about 1.2:1 and then reacting the polyaminopolyamide, in aqueous solution with from about 1 mole to about 1.5 moles of epihalohydrin per mole of tertiary amine groups present in said polyaminopolyamide.

4,515,658
RETENTION AIDS

Dodd W. Fong, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 20, 1984, Ser. No. 642,280
Int. Cl.³ D21H *3/38*
U.S. Cl. 162—168.4 5 Claims

1. A method for improving fine and filler retention of paper during its manufacture into a sheet from pulp which comprises treating the pulp prior to sheet formation with a fine and filler retention retaining amount of a copolymer which contains between 2–50 mole percent of a lower alkyl quaternary ammonium salt of 1-acryloyl-4-methyl piperazine which has a molecular weight of at least 1,000,000.

4,515,659
PYROLYTIC CONVERSION OF PLASTIC AND RUBBER WASTE TO HYDROCARBONS WITH BASIC SALT CATALYSTS

Robert C. Wingfield, Jr.; Jacob Braslaw, both of Southfield, and Roy L. Gealer, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,586
Int. Cl.³ C10B *53/00, 57/04, 57/12*
U.S. Cl. 201—2.5 11 Claims

1. A process for pyrolytic conversion of waste selected from the group consisting of plastic and rubber to olefinic hydrocarbons, said process being characterized by comprising:

introducing into a pyrolysis zone particles of said waste and at least about 1 weight percent basic salt catalyst based on the weight of said waste;

heating said waste/salt mixture in said pyrolysis zone to a temperature of between about 400° C. and about 700° C. while flowing inert gas therethrough;

maintaining said temperature of said pyrolysis zone and said flowing gas for a time sufficient to pyrolyze said waste to char and volatile hydrocarboncontaining products;

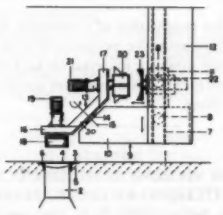
cooling said volatile products so as to separate said products into a gas fraction and oil fractions; and

recovering said fractions.

4,515,660
APPARATUS FOR REMOVING CHARGING HOLE COVERS AND FOR CLEANING SEALING SURFACES IN A COKE OVEN

Hans-Jurgen Kwasnik, Herne; Hans-Gunter Piduch, and Heinz-Dieter Bruske, both of Bochum, all of Fed. Rep. of Germany, assignors to C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed May 2, 1984, Ser. No. 606,234
Claims priority, application Fed. Rep. of Germany, May 9, 1983, 3316936
Int. Cl.³ C10B *25/20*
U.S. Cl. 202—241 7 Claims



1. An apparatus carried by a coal-charging car movable along an oven roof of a battery of horizontal coke oven chambers for removing charging hole covers and for cleaning sealing surfaces, said apparatus including the combination of a support member having guide means for vertical movement on a charging car, a support head carried by a shaft to pivot about a first axis on said support member, a magnetic gripper carried by a shaft rotatable about a second axis on said head, and a charging hole frame cleaner including a cleaning tool carried by a shaft to rotate about a third axis on said support head, said first axis bisecting the angle between said second and third axes

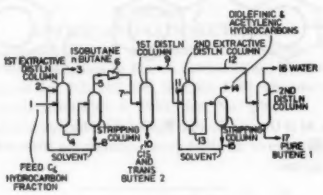
which are disposed in a plane at an angle to one another on opposite sides of said first axis.

4,515,661

PROCESS FOR SEPARATING HIGHLY PURE BUTENE-1 AND BUTENE-2

Shunichiro Ogura, Tokyo, and Masamichi Soumai, Yokohama, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,871
Claims priority, application Japan, Oct. 13, 1981, 56-163073; Oct. 13, 1981, 56-163074
Int. Cl.³ B01D *3/40*; C07C *7/04*
U.S. Cl. 203—60 **3 Claims**



1. A process for separating highly pure butene-2 and highly pure butene-1 substantially free from diolefinic and acetylenic hydrocarbons from a C_4 hydrocarbon fraction containing isobutane, n-butane, butene-1, butene-2, and at least one hydrocarbon selected from diolefinic hydrocarbons and acetylenic hydrocarbons, which comprises

(1) as a first extractive distillation step, treating the C_4 hydrocarbon fraction with a polar solvent in a first extractive distillation column to separate it into an overhead product containing isobutane and n-butane as main ingredients and a bottoms product containing butene-1, butene-2 and said at least one hydrocarbon as main ingredients,

(2) as a first distillation step, introducing the bottoms product from step (1) into a first distillation column to obtain a fraction containing butene-1, and said at least one hydrocarbon as main ingredients from the top of the column and purified butene-2 from the bottom of the column,

(3) as a second extractive distillation step, introducing the fraction obtained in step (2) containing butene-1 as main ingredients into a second extractive distillation column and treating it with a polar solvent to separate it into an overhead product containing butene-1 as a main ingredient and a bottoms product containing said at least one hydrocarbon as main ingredients, and

(4) as a second distillation step, introducing the overhead product obtained in step (3) into a second distillation column to remove a tiny amount of water from the top of the column and obtain purified butene-1 from the bottom of the column.

4,515,662

PROCESS FOR FABRICATING PRECISION OPTICAL SPACERS FOR IMAGE SENSOR FILTERS

William S. Phy, Los Altos Hill, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

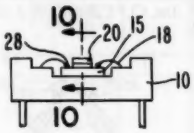
Division of Ser. No. 233,347, Feb. 11, 1981, Pat. No. 4,388,525. This application Feb. 7, 1983, Ser. No. 464,187
Int. Cl.³ C25D *5/02*
U.S. Cl. 204—15 **14 Claims**

1. A process for fabricating spacers of a desired thickness for separating a filter from an underlying integrated circuit structure, comprising the steps of:

forming a pattern of an electrically conductive material on one surface of the filter, the pattern being substantially thinner than the desired thickness;

depositing a selected material over all of the filter except on the electrically conductive material, the selected material being deposited to substantially the desired thickness;

depositing additional electrically conductive material on at least the pattern such that the pattern and the selected



material cooperate to ensure that the electrically conductive material deposits substantially uniformly to the desired thickness; and

removing the selected material.

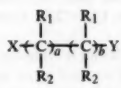
4,515,663

ACID ZINC AND ZINC ALLOY ELECTROPLATING SOLUTION AND PROCESS

Alice M. Strom, Warren; R. Wilbur Herr, Troy, and Sylvia Martin, Utica, all of Mich., assignors to OMI International Corporation, Warren, Mich.

Filed Jan. 9, 1984, Ser. No. 568,361
Int. Cl.³ C25D *3/22, 3/56*
U.S. Cl. 204—44.2 **19 Claims**

1. An aqueous acid electroplating solution containing zinc ions in an amount effective to electrodeposit zinc, and optionally cobalt and/or nickel ions in an amount effective to electrodeposit a zinc-cobalt, zinc-nickel, and zinc-cobalt-nickel alloy; boric acid and the bath soluble compatible salts thereof present in an amount of about 2.5 g/l to 25 g/l calculated as boric acid, hydrogen ions present inn an amount to provide a pH on the acid side, and a bath soluble and compatible polyhydroxy additive agent containing at least 3 hydroxyl groups and at least 4 carbon atoms of the structural formula:

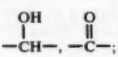


Wherein:

R_1 is —H, —CH_2—OH, an alkyl group containing 1–4 carbon atoms, a bridging group defined by —R_3—;

R_2 is —H, —OH, —CH_2OH, a bridging group defined by —R_4—;

—R_3— is —CH_2—,



—R_4— is —$(CH_2)_c$—, or —CH_2—O—CH_2—;

X and Y are the same or different and are

—NR_5; —SO_3H, an alkyl, alkenyl, alkynyl group containing 1 to 4 carbon atoms; an hydroxy alkyl group containing 1–4 carbon atoms, and hydroxy alkenyl and hydroxy alkynyl group containing 3 to 5 carbon atoms;

R_5 is —H, an alkyl, alkenyl, alkynyl, or hydroxy alkyl group containing 1–4 carbons;

a is an integer ranging from 0–6;

b is an integer ranging from 0–6;

c is an integer ranging from 1–5; and

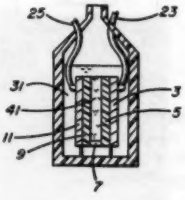
a+b is an integer from 1–6;

as well as the compatible bath soluble Group IA and IIA, zinc and ammonium salts thereof and mixtures thereof.

4,515,664
ELECTRO ORGANIC METHOD

Malcolm Korach, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 478,930, Mar. 25, 1983, Pat. No. 4,445,983.
This application Jan. 27, 1984, Ser. No. 574,502
Int. Cl.³ C25B 1/30, 3/04
U.S. Cl. 204—62 6 Claims



1. A method of electrolytically forming hydrogen peroxide in a solid polymer electrolyte electrolytic cell having an anode, a cathode, and solid electrolyte means therebetween whereby to divide the cell into an anode compartment and a cathode compartment, which method comprises providing a non-aqueous media containing a quinone chosen from the group consisting of 2-alkyltetrahydroanthraquinone, 2-alkylanthraquinone, and mixtures thereof to the cathode compartment, passing an electrical current from the anode to the cathode whereby to evolve a reduced form of the quinone, and thereafter oxidizing the reduced form of the quinone by the introduction of oxygen whereby to regenerate the quinone and produce hydrogen peroxide.

4,515,665
METHOD OF STABILIZING METAL-SILICA COMPLEXES IN ALKALI METAL HALIDE BRINES

David L. Fair, Chattanooga; David D. Justice, Cleveland, and Pilar P. Kelly, Knoxville, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Oct. 24, 1983, Ser. No. 544,677
Int. Cl.³ C25B 1/46
U.S. Cl. 204—98 12 Claims

1. A process for stabilizing a complex of metal and silica in an alkali metal halide brine used as an anolyte feedstock in an electrolytic membrane cell having an anolyte compartment and a catholyte compartment, said process comprising

(a) adjusting the pH of said brine to a level of between about 4 and about 12; and

(b) passing said pH adjusted brine into said anolyte compartment while operating said cell under conditions which maintain the pH of said brine during electrolysis at a value above about 3.5, said operating conditions comprising

(i) initially charging said catholyte compartment with a caustic solution having an alkali metal hydroxide concentration of between about 26% to about 30% at the startup of said cell; and

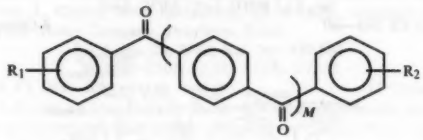
(ii) changing the concentration of the caustic solution in said catholyte compartment so that, over a period of from about 15 to about 35 days, said alkali metal hydroxide concentration builds up to between about 32% and about 40%.

4,515,666
RADIATION-STABLE POLYOLEFIN COMPOSITIONS CONTAINING AROMATIC KETONE COMPOUNDS

John W. Rekers, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 28, 1983, Ser. No. 470,189
Int. Cl.³ C08K 5/13, 5/07
U.S. Cl. 204—159.2 2 Claims

1. A method for sterilizing a shaped article made from an olefinic polymer composition which comprises subjecting said shaped article to high energy radiation in an amount sufficient to sterilize said shaped article; said olefinic polymer composition comprising an olefinic polymer selected from homopolymers and copolymers made from aliphatic, ethylenically unsaturated monomers containing from 2 to about 10 carbon atoms; from about 100 to about 3,000 parts per million based upon the weight of the total composition of a hindered phenolic stabilizer; and from about 100 to about 10,000 parts per million based upon the weight of the composition of a stabilizer selected from compounds of the formula:



wherein M is 0 or 1; R_1 and R_2 are each independently selected from hydrogen or an alkyl group containing from 1 to about 20 carbon atoms.

4,515,667
NOVEL CATALYSTS AND PROCESSES FOR THE PHOTOCHEMICAL DECARBOXYLATION OF ALPHA-HYDROXY CARBOXYLIC ACIDS

Rosemary Bartoszek-Loza, Solon, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

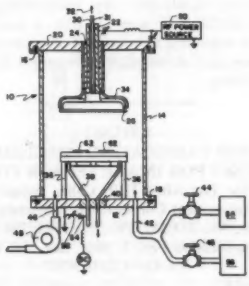
Filed Jul. 19, 1983, Ser. No. 515,233
Int. Cl.³ C07C 3/24
U.S. Cl. 204—162 R 13 Claims

1. A process for the photochemical decarboxylation of an alpha-hydroxy carboxylic acid to the corresponding alcohol which process comprises irradiating a mixture of (a) a solution of an alpha-hydroxy carboxylic acid and (b) a metal titanate.

4,515,668
METHOD OF FORMING A DIELECTRIC LAYER COMPRISING A GETTERING MATERIAL

David J. Brownell, Maple Grove, and Jon A. Roberts, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 25, 1984, Ser. No. 603,858
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 D 27 Claims



1. A method of forming a thin film dielectric layer on a substrate, comprising:

providing a sputtering chamber having a dielectric target disposed on a target electrdode;

introducing into the sputtering chamber a substrate to be covered with a thin film dielectric layer and locating the sub-

strate on a substrate holder electrode spaced from the target electrode;

evacuating the chamber;

introducing into the chamber a sputtering atmosphere comprising an inert gas and a gas containing an element of a gettering material, the gas containing an element of a gettering material being transferred into the chamber through a metering valve from a container outside the chamber; and

applying an RF potential across the target electrode and the substrate holder electrode to establish a glow discharge in the region between the electrodes in order to deposit a thin film dielectric layer doped with a gettering material formed by a chemical reaction in the chamber.

4,515,669

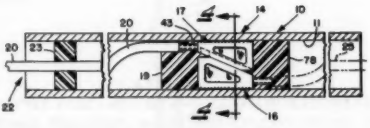
ANODE AND CONNECTION

James R. Dimond, Burton, and James B. Bushman, Medina, both of Ohio, assignors to Harco Corporation, Medina, Ohio

Continuation of Ser. No. 302,855, Sep. 16, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 526,459

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—196 **38 Claims**



1. A tubular cathodic protection anode including a tubular anode member with outside surface means for transmitting a flow of electricity between said anode member and a surrounding medium and an inside surface, an internal electrical connection, said connection comprising at least two opposed wedge blocks, said wedge blocks being adapted relatively to be driven axially to be wedged tightly radially against said inside surface of said tubular anode member, said blocks being of such dimensions that a sealant flow passage open at both axial ends of the wedge blocks to facilitate sealing of the wedge blocks in the anode member is formed interiorly of the anode member along a side of the blocks, and an electrical lead connected to at least one of said blocks.

4,515,670

DEVICE FOR GALVANICALLY APPLYING A METAL COATING

Harry C. Piepers, Eindhoven, and Gerard J. van Poele, Drunen, both of Netherlands, assignors to Meco Equipment Engineers, B.V., Netherlands

Filed Feb. 24, 1984, Ser. No. 582,993

Int. Cl.³ C25D *17/28, 17/06*

U.S. Cl. 204—199 **15 Claims**

1. An electroplating device for applying a coating of metal, particularly precious metal, to separate objects comprising:

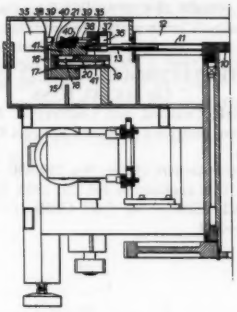
(A) a wheel-shaped member;

(B) a driving source coupled to said wheel-shaped member to rotate said member about a rotary axis;

(C) a plurality of holder means arranged one behind the other and fastened to said wheel-shaped member, each of said holder means defining grooves for receiving a predetermined number of said objects arranged side by side and which further includes masking members arranged so as to be movable transversely of the rotary axis of said wheel for at least partly covering said objects received in said holder;

(D) means on said holder for supporting said objects;

(E) at least one reservoir arranged below said wheel-shaped member and having at least one opening on its top side and being in sealing relationship at least around said opening with the underside of said wheel-shaped member; and



(F) means for supplying pressurized electrolyte to said reservoir, said wheel-shaped member and said holder having passages for guiding electrolyte from said reservoir to said objects supported by said holder.

4,515,671

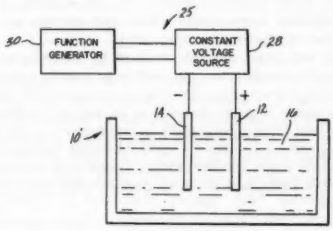
ELECTROCHEMICAL TREATMENT OF COPPER FOR IMPROVING ITS BOND STRENGTH

Ned W. Polan, Madison, and Chung-Yao Chao, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 460,630, Jan. 24, 1983, Pat. No. 4,468,293, which is a continuation-in-part of Ser. No. 355,053, Mar. 5, 1982, abandoned. This application Jan. 30, 1984, Ser. No. 575,240

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—228 **3 Claims**



1. An apparatus for treating metal foil for enhancing its ability to adhere to a substrate, said apparatus comprising:

means for containing an electrolytic bath solution containing a concentration of metal;

an anode and a cathode immersed in said solution;

said cathode comprising said metal foil;

means for providing a non-zero base cathodic current having a desired frequency and a desired waveform comprising recurring pulses with each said pulse comprising a first portion having a first current density for a first time period, a base portion having a second current density for a second time period, said first current density being greater than the limiting current density and substantially larger than said second current density, said second current density being less than the limiting current density, and said first time period being less than about 0.125 seconds;

said current providing means comprising a source of direct current and a function generator for modifying the direct current signal from said source to produce said current with said desired waveform; and

means for applying said current to said cathode and anode so that said foil is subjected to more than 10 of said pulses so

that metal from said solution is deposited onto said foil as a fine dendritic plating having improved peel strength, improved resistance to wear and stress, and improved powder transfer characteristics.

4,515,672

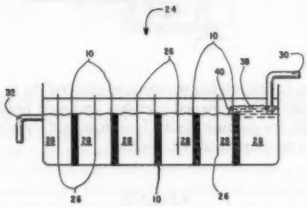
RETICULATE ELECTRODE AND CELL FOR RECOVERY OF METAL IONS

Gary F. Platek, Concord, and Geoffrey P. Krug, Painesville, both of Ohio, assignors to Eltech systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 319,480, Nov. 9, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 516,867

Int. Cl.³ C25C *7/00, 7/02;* **C25B** *11/12, 11/03*

U.S. Cl. 204—269 **5 Claims**



1. In an electrolytic cell having no separator between an anode and cathode of a cell pair for removal of a metal ion contained in a waste water stream comprising,

a non-conductive cell box including inlet and outlet means to introduce said stream into said cell box and lead it away therefrom, respectively;

plural anodes and alternating reticulate cathodes in spaced-apart relationship removably disposed in said cell box normal to the direction of flow of said solution, and bus bars disposed horizontally above said anodes and cathodes; the improvement comprising,

each said reticulate cathode formed by electroplating an electrically conductive open cell foam having a resistivity in the range from about 40 ohm-cm to about 1000 ohm-cm with a single deposit of metal in an amount sufficient to render said foam substantially as conductive as said metal, and to produce a relatively rigid reticulate through which said waste water stream initially flows with substantially negligible resistance so as to deposit said metal on said cathode.

4,515,673

ELECTRODE WITH ANODE ACTIVE LAYER

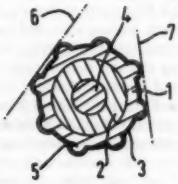
Peter C. S. Hayfield, Church Garth, England, assignor to Marston Palmer Limited, Wolverhampton, England

Filed Oct. 11, 1983, Ser. No. 540,856

Claims priority, application United Kingdom, Oct. 29, 1982, 8231029; Jun. 21, 1983, 8316808

Int. Cl.³ C25B *11/00*

U.S. Cl. 204—290 F **12 Claims**



1. An electrode comprising a metal substrate of a metal chosen from the group titanium and niobium with an anodically active layer, the anodically active layer having been produced by heating in an oxidising atmosphere at temperatures in excess of 350° C., there being provided a layer of tantalum or an alloy containing more than 50% of tantalum in metallic form between the anodically active layer and the substrate.

4,515,674

ELECTRODE FOR CATIONIC ELECTRODEPOSITION COATING

Yoshinobu Takahashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 3, 1982, Ser. No. 404,659

Claims priority, application Japan, Aug. 7, 1981, 56-117574[U]; Aug. 12, 1981, 56-119556[U]

Int. Cl.³ C25B *11/04*

U.S. Cl. 204—292 **6 Claims**

1. An electrode for cationic electrodeposition coating which comprises:

(a) a cylindrical body with one end thereof closed, said body being made of a sintered metal oxide comprising 30 to 50 mole percent of FeO and 50 to 70 mole percent of Fe_2O_3 or 95 to 60 mole percent of Fe_2O_3 and 5 to 40 mole percent of at least one metal oxide of Mn, Ni, Co, Mg, Cu, Zn or Cd, said sintered metal oxide having a volume specific resistance of not more than 100,000 ohms-cm; and

(b) a core material of a metal member inserted into said cylindrical body by means of a bonding agent of a conductive material, wherein said cylindrical body comprises at least two divided cylindrical bodies, a cylindrical hollow member of hard resin being fitted bridging over the joint between the adjacent divided cylindrical bodies, with the divided cylindrical bodies being integrated by means of a curable resin.

4,515,675

MAGNETRON CATHODE FOR CATHODIC EVAPORTION APPARATUS

Jörg Kieser, Albstadt; Reiner Kukla, Hanau, and Gerd Deppisch, Aschaffenburg, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 624,940

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324248

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **11 Claims**

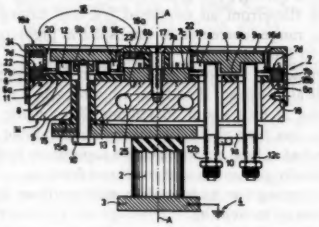
1. A magnetron cathode for cathodic evaporation apparatus, comprising:

a target holder for releasably securing a plate-like target having a target face;

magnet means having pole faces parallel to the target face for producing at least one tunnel of magnetic field lines, which is circumferentially closed and overlaps the target and;

at least one housing for said magnet means, said housing

being of non-ferromagnetic material which extends over the pole faces, the projections of said target and said pole faces in a common plane parallel to the target face being non-intersecting with respect to each other, in the zone of



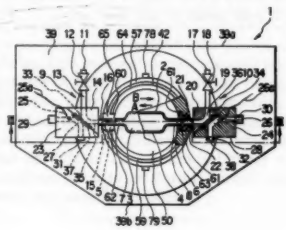
the pole faces said housing being extended in the atomization direction at least to the plane of said target face, and said housing together with said magnet means being electrically insulated as regards both said target holder and ground.

4,515,676

CELL UNIT FOR OBSERVING ELECTROPHORESIS

Yoshio Kawai, Musashino, and Kiyoshi Kitagawa, Komae, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,322
Claims priority, application Japan, Dec. 10, 1982, 57-216540
Int. Cl.³ G01N *27/28*
U.S. Cl. 204—299 R **16 Claims**



1. A cell unit for observing electrophoresis, said cell unit comprising:

(a) an electrophoretic measurement cell;

(b) first fluid conduit means for introducing a fluid specimen into said electrophoretic measurement cell;

(c) second fluid conduit means for removing a fluid specimen from said electrophoretic measurement cell;

(d) first and second enclosure means for enclosing said electrophoretic measurement cell;

(e) a gasket seal means in the form of an endless loop disposed between said first and second enclosure means and providing a fluid-tight seal therebetween, said gasket seal means having penetrating holes therethrough through which said first and second fluid conduit means pass in a fluid-tight fashion, and;

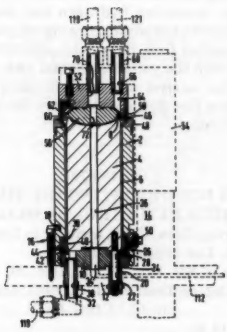
(f) said first and second enclosure means and said gasket seal means together defining a space in thermal contact with said electrophoretic measurement cell for accomodating a fluid used to control the temperature of a liquid specimen in said electrophoretic measurement cell.

4,515,677

APPARATUS FOR ELECTROCOATING

Michael J. Heathcoat, Faringdon; Douglas H. Jackson; Frederick W. Jowitt, both of Wantage; Jack R. Madley, Garsington, and Ian C. E. Stuart, Nr. Abingdon, all of England, assignors to Metal Box Limited, Reading, England

Continuation of Ser. No. 309,350, Oct. 7, 1981,. This application Jul. 29, 1983, Ser. No. 517,740
Claims priority, application United Kingdom, Oct. 15, 1980, 8033282
Int. Cl.³ C25D *13/14*
U.S. Cl. 204—300 EC **8 Claims**



1. Apparatus for electrocoating internal and external surfaces of a can, said apparatus comprising: a cell including a cylindrical housing (2) having a fixed base and a movable lid (52), a mandrel (4) extending axially within said housing, the mandrel (4) forming a first electrode having a surface of substantially the same shape as the internal surface of a can to be electrocoated, a first fluid passage (36) extending axially through said mandrel, a second electrode (56) carried by said cylindrical housing, the second electrode having a surface of substantially the same shape as an external surface of a can to be electrocoated, a second fluid passage (72) extending through said second electrode coaxially of said housing, and guide means (40, 44) carried by said housing and arranged to positively locate a can in an inverted position in the housing such that the first electrode is uniformly spaced from the internal surface of the can and the second electrode is uniformly spaced from the external surface of the can, said guide means also forming contact means (40, 50) arranged to make electrical contact with a can received within the housing, wherein said guide means comprises an annular metal seal (40) carried by said housing and dimensioned such that the free edge of a can to be electrocoated is a push fit therewithin whereby said metal seal positively locates the can and makes electrical contact therewith, and wherein said contact means also comprises a contact (50) electrically connected to said metal seal, means for flowing an electrocoating fluid between each surface of the can and the corresponding surface of the first and second electrodes, and means for applying at least one electrocoating pulse between each of said first and second electrodes and the can, the total duration of electrocoating pulses being in the range 10 msec to 500 msec.

4,515,678

PROCESS AND CATALYST FOR THE HYDROGENATION OF COAL

Hans J. Wernicke, Wolfratshausen-Waldram, and Heinz Zimmerman, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Oct. 20, 1982, Ser. No. 435,431
Int. Cl.³ C10G 1/06
U.S. Cl. 208—10 4 Claims

1. The process of coal hydrogenation consisting essentially of combining a flowable mixture of blast furnace flue dust, finely divided coal particles and liquid hydrocarbons, pressurizing the mixture to high pressure and heating the mixture with hydrogen so that the blast furnace flue dust acts as a hydrogenation catalyst, separating gaseous products and liquid and solid reaction products, separating by boiling the liquid products under atmospheric pressure and under vacuum and passing the remaining residue to partial oxidation, partially oxidizing the residue, producing hydrogen and slag containing the blast furnace flue dust catalyst, drawing off the slag containing the flue dust catalyst from the partial oxidation slag, returning slag resulting from the partial oxidation and

containing the catalyst to a blast furnace, and reusing the blast furnace flue dust catalyst from the hydrogenation in the blast furnace.

4,515,679

PROCESS FOR RETORTING OIL SHALE WITH FLUIDIZED RETORTING OF SHALE FINES

Roland F. Deering, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 451,602, Dec. 20, 1982, Pat. No. 4,448,668. This application Jul. 5, 1983, Ser. No. 510,402
Int. Cl.³ C10G 1/02
U.S. Cl. 208—11 R 63 Claims

1. A retorting process comprising:

retorting hydrocarbon-containing particles of a size not readily fluidizable by contact with heated gases in a retorting zone;

crushing hot, uncombusted particles removed from said retorting zone in a crushing zone to a size more readily fluidizable;

maintaining hot, crushed, uncombusted particles removed from said crushing zone in a fluidization zone as a fluidized bed under substantially non-combustive conditions;

retorting raw hydrocarbon-containing fines introduced into said fluidization zone so as to educe hydrocarbon vapors from said fines;

recovering the educed hydrocarbon vapors; and

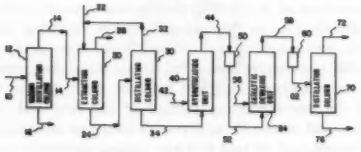
recovering retorted particulates from said fluidization zone.

4,515,680

NAPHTHENIC LUBE OILS

William P. Hettinger, Jr., Russell, Ky.; Frank H. Turrill, Huntington, W. Va.; George J. Rozman, and H. Wayne Beck, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 16, 1983, Ser. No. 494,739
Int. Cl.³ C10G 55/00, 55/02
U.S. Cl. 208—87 11 Claims



11. A process for preparing a high quality lubricating oil base stock having a viscosity in the range of about 700 to 1,000 SUS at 100° F., having a pour point of less than about 20° F., and containing at least about 50 volume % naphthenic hydrocarbons which consists essentially of:

(a) vacuum distilling a reduced crude cut having an atmospheric boiling point greater than about 650° F. and recovering therefrom an overhead fraction having a boiling point range (corrected to atmospheric pressure) of about 675 to 1100° F.

(b) contacting the overhead fraction from step (a) with furfural to extract therefrom a hydrocarbon mixture containing at least about 50 volume % aromatic hydrocarbons, less than about 10 volume % paraffinic hydrocarbons and at least a portion of the naphthenic hydrocarbons originally present in said overhead fraction,

(c) recovering the hydrocarbon mixture from the furfural employed in step (b),

(d) hydrotreating the hydrocarbon mixture from step (c) with hydrogen at a temperature in the range of about 620 to 750° F under a pressure in the range of about 1500 to 2500 psi at a LHSV in the range of about 0.25 to 1.0 in the presence of cobalt-molybdenum or a nickel-molybdenum catalyst supported on a refractory inorganic oxide,

(e) catalytically dewaxing the product of step (d) by treating said product with hydrogen at a temperature in the range of about 500 to 1000° F. under a pressure of about 1000 to 3000 psi at a LHSV of about 0.1 to 10 in the presence of a noble metal, or a Group VI-B metal, or a Group VIII metal supported on an acidic zeolite support,

(f) distilling from the product of step (e) materials boiling below about 650° F., and

(g) distilling the product from step (f) under vacuum to remove additional low boiling fractions and recovering as a bottoms fraction a lubricating oil base stock having a viscosity of about 700 to 1,000 SUS at 100° F., containing at least about 50 volume % naphthenic hydrocarbons and less than about 40 volume % aromatic hydrocarbons and having a pour point of less than about 20° F.

4,515,681

CATALYTIC DEWAXING USING COLLAPSED LARGE PORE ZEOLITES

Ian A. Cody, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 8, 1982, Ser. No. 416,092
Int. Cl.³ C10G 47/16
U.S. Cl. 208—111 31 Claims

1. A hydrocracking process for reducing the pour point and wax content of waxy hydrocarbon oils comprising contacting said waxy hydrocarbon oil under hydrocracking conditions with a very low crystallinity (VLC) metal-containing catalyst made from a large-pore zeolite having a low SiO_2/Al_2O_3 ratio made by the process comprising:

(a) exchanging more than about 50% of exchangeable cations from said zeolite with a material that produces hydroxyl groups during calcination,

(b) calcining the exchanged zeolite at a temperature above about 300° C. in a substantially dry atmosphere to reduce crystallinity in said zeolite by at least about 50%, and

(c) loading a catalytic metal either before or after said calcination.

4,515,682

CATALYSIS OVER ACTIVATED HIGH SILICA ZEOLITES

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 375,076, May 5, 1982, Pat. No. 4,444,900. This application Feb. 17, 1984, Ser. No. 581,498

Int. Cl.[3] C10G *11/05, 47/08, 47/16*

U.S. Cl. 208—111 17 Claims

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a crystalline zeolite having an initial silica:alumina mole ratio greater than about 100:1 and having been synthesized from a reaction mixture comprising a diamine, said zeolite being treated by the squential steps of reacting said zeolite with a dilute aqueous solution of hydrogen fluoride of from about 0.1 to about 5 Normal at a temperature of from about 0° C. to about 30° C. for a time of less than about 60 minutes, contacting said hydrogen fluoride reacted zeolite with aluminum chloride vapor at a temperature of from about 100° C. to about 850° C., and converting said aluminum chloride contacted zeolite to hydrogen form.

4,515,683

PASSIVATION OF VANADIUM ACCUMULATED ON CATALYTIC SOLID FLUIDIZABLE PARTICLES

H. Wayne Beck; Charles F. Lochow, Jr., both of Russell, and Charles W. Nibert, Ashland, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 15, 1983, Ser. No. 532,252

Int. Cl.[3] C10G *11/05*

U.S. Cl. 208—113 8 Claims

1. In a process for catalytic cracking of hydrocarbon feed materials boiling above about 316° C. (600° F.) comprising vanadium contaminants with fluidizable particle material and wherein regeneration of the particle material to remove hydrocarbonaceous deposits by combustion converts deposited vanadium to low melting oxides whereby the oxides of vanadium flow across the particle material surface causing pore plugging and agglomeration of fluid particle material beyond fluidization capability, the improvement for passivating deposited vanadium to reduce its degrading characteristics which comprises nonionic deposition of lanthanum or lanthanum-rich rare earths on said particle in an amount sufficient to passivate deposited vanadium prior to or during contact between said particle material and said feed material.

4,515,684

OIL RECLAMATION PROCESS AND APPARATUS THEREFOR

Edward G. Brown, Beverly Hills, Calif., assignor to CBM-Oil Reclamation Systems, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 310,895, Oct. 13, 1981, abandoned. This application Oct. 26, 1983, Ser. No. 545,466

Int. Cl.[3] C10M *11/00*

U.S. Cl. 208—180 43 Claims

37. A batch process for reclamation of oil from emulsified mixtures of oil, water and particulate solids which comprises:

(a) providing at least one settling tank having an internal mixing centerwell formed of an indirect annular heat exchange zone defined by annular inner and outer walls of the first centerwell and having a fluid inlet and outlet for passage of a heating or cooling fluid therethrough, in open downward flow communication with a surrounding quiescent settling zone of the first settling tank;

(b) at least substantially filling said settling zone with said emulsified mixture;

(c) introducing flow of a heating fluid to said annular heating zone to internally heat the contents thereof to a predetermined temperature below the oil-oxidation temperature, with agitation, substantially confined to said mixing centerwell while adding a demulsifying agent to said mixing centerwell in a quantity sufficient to cause demulsification of the emulsified mixture of oil, water and particulate solids;

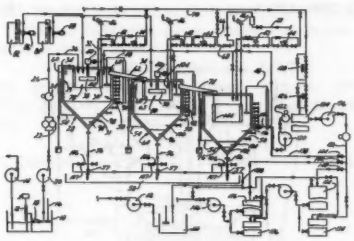
(d) discontinuing agitation and forming from the demulsified emulsion a clarified-oil phase, a water phase, and a sludge phase; and

(e) water-displacing the clarified oil from the settling zone to an oil-surge tank.

41. A system for reclaiming oil from emulsion mixtures comprising oil, water and particulate solids which comprises:

(a) at least one insulated settling tank having:

(i) a removable lid, a vertically-oriented internal mixing centerwell of a given volume forming indirect heat exchange having at least two connected concentric cylindrical annular surfaces having a fluid inlet and outlet for passage of at least a heating fluid there-



through, said mixing centerwell extending downward from the lid communicating in open downward flow relation with an annularly surrounding settling zone of the settling tank formed of a cylindrical side and a conical base having an outlet for discharge of at least sludge and a first internal annular overflow weir at the upper end of said cylindrical side adjacent the removable lid; and

(ii) agitation means adjustably extending into said vertically-oriented internal mixing centerwell, said agitation means having a vertically-adjustable agitator for control of agitator extension into the vertically-oriented mixing centerwell for selectively confining agitation to said mixing centerwell;

(b) means to introduce emulsion mixtures and demulsifying agent to said vertically-oriented mixing centerwell;

(c) a surge tank in flow communication with said annular overflow weir and internal means for heating or cooling the contents thereof.

4,515,685

TREATMENT AND SEPARATION OF PETROLEUMS AND RELATED MATERIALS

George C. Yeh, 2 Smedley Dr., Newtown Square, Pa. 19073

Continuation of Ser. No. 399,853, Jul. 19, 1982, abandoned. This application May 8, 1984, Ser. No. 608,263

Int. Cl.[3] C10C *3/00, 3/08*

U.S. Cl. 208—309 18 Claims

1. A method for treating a liquid hydrocarbon feedstock containing asphaltenes having resins and heavy aromatic compounds associated therewith to remove said asphaltenes which comprises

(A) intimately mixing said feedstock with asphaltenes which are substantially free of resins and heavy aromatic compounds while maintaining said feedstock at a temperature below the boiling point of said feedstock, the amount of said asphaltenes combined with said feedstock being sufficient to break the equilibrum existing between the asphaltenes initially present in said feedstock and the resins and

heavy aromatic compounds associated therewith to cause precipitation of substantially all of the asphaltenes initially present in said feedstock and added asphaltenes,

(B) separating precipitated asphaltenes from said feedstock by subjecting said feedstock containing added asphaltenes to a mechanical separation, and

(C) recovering a liquid hydrocarbon fraction of substantially reduced asphaltenes content.

4,515,686

METHOD FOR THE OPERATION OF AN AIR SEPARATOR, AND AN AIR SEPARATOR FOR THE PRACTICE OF THE METHOD

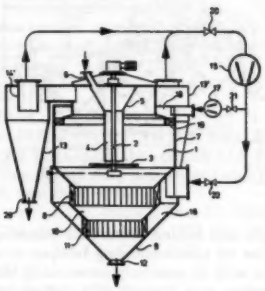
Hans-Jürgen Janich, Neubeckum, Fed. Rep. of Germany, assignor to PKS-Engineering GmbH & Co. KG, Neubeckum, Fed. Rep. of Germany

Filed Jun. 15, 1983, Ser. No. 504,652

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222878

Int. Cl.³ B07B *7/10*

U.S. Cl. 209—139 A 21 Claims



1. Method for the operation of an air separator, prefereably a circulating air separator, which is equipped with a separating chamber terminating at its bottom in a coarse material collector provided with a discharge spout into which collector the feedstock is delivered in dispersed form and is seized by an upward stream flowing through the separating chamber rotatingly from bottom to top, the coarse material being moved towards the separating chamber casing periphery and the fines being removed from the separating chamber by a removal air stream, characterized in that to the upward air stream a flow rotating in the same sense is delivered adjacent the casing periphery (7) and seizes and carries away the coarse material.

4,515,687

ORE FLOTATION AND FLOTATION AGENTS FOR USE THEREIN

Clarence R. Bresson, and Rector P. Louthan, both of c/o French, Hughes and Doescher, P.O. Box 2443, Bartlesville, Okla. 74005

Filed May 10, 1984, Ser. No. 608,825

Int. Cl.³ B03D *1/06;* C09K *3/00;* C22B *3/00;* C07C *154/02*

U.S. Cl. 209—167 34 Claims

11. A process for producing a novel composition of matter comprising:

reacting H_2S with a composition having the formula

$$R^1R^2NR^3OCX, \quad (I)$$

wherein R^1 is selected from the group consisting of alkyl radicals each having no more than 6 carbon atoms, R^2 is selected from the group consisting of alkylene radicals each having no more than 6 carbon atoms, and X is selected from the group consisting of alkenyl radicals each having no more than 6 carbon atoms, to form a composition having the formula

$$R^1R^2NR^3OCR^4SH, \quad (II)$$

wherein R^4 is selected from the group consisting of alkylene radicals each having no more than 6 carbon atoms.

14. A process in accordance with claim 11 characterized further to include reacting the composition of formula (II) with CS_2 and a hydroxide having the formula

$$MOH \quad (III),$$

wherein M is selected from the group consisting of ammonium and alkali metals to form a composition having the formula

$$R^1R^2NR^3OCR^4S-\overset{S}{\overset{\|}{C}}-S-M, \quad (IV)$$

and recovering the composition of formula (IV) as the product of the process.

22. A process for recovering minerals comprising:

(a) mixing crushed ore containing minerals, water and a composition having the formula

$$R^1R^2NR^3OCR^4S-\overset{S}{\overset{\|}{C}}-S-M,$$

wherein R^1 is selected from the group consisting of alkyl radicals each having no more than 6 carbon atoms, R^2 is selected from the group consisting of alkyl radicals each having no more than 6 carbon atoms, R^3 is selected from the group consisting of alkylene radicals each having no more than 6 carbon atoms, R^4 is selected from the group consisting of alkylene radicals each having no more than 6 carbon atoms, and M is selected from the group consisting of ammonium and alkali metals, to establish a pulp;

(b) aerating said thus established pulp to produce a froth containing said minerals; and

(c) recovering said minerals from said thus produced froth.

4,515,688

PROCESS FOR THE SELECTIVE SEPARATION OF BASE METAL SULFIDES AND OXIDES CONTAINED IN AN ORE

Alfredo P. Vargas, La Paz, Bolivia, assignor to South American Placers, Inc., Peru

Continuation-in-part of Ser. No. 410,127, Aug. 20, 1982, abandoned. This application Mar. 18, 1983, Ser. No. 476,611

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—167 22 Claims

1. A process for the separation for the mineral components of an ore, said ore comprising base metal sulfides including pyrite, by sequential flotation, said process comprising in sequence:

(a) grinding said ore to form ore pulp and mixing said pulp with sulfide ions and cyanide ions at amounts:

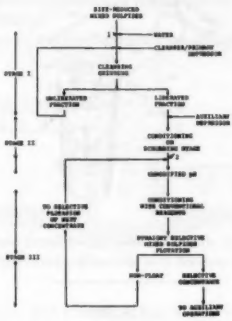
(i) sufficient to depress pyrite and to inhibit flotation of all the other base metal sulfides contained in said ore except the sulfides of the metal which will be floated first, but

(ii) insufficient to cause overdepression of said other base metal sulfides; said ions having been introduced into said pulp at predetermined times in a predetermined sequence prior to flotation;

said sulfide ion amounts ranging between about 8 and about 82

g/ton of ore and said cyanide ion concentration ranging between about 11 and about 110 g/ton of ore;

(b) adding a collector, for the sulfides of the metal which were not inhibited in said step (a)(i); to said ion-containing pulp and



(c) floating the sulfides of the metal which were not inhibited in said step (a)(i); wherein said process takes place at a pH essentially determined by the ore composition and the quality of the water used to form said pulp, said pH, as so determined, ranging between about 5.5 and about 8.5, without addition of substantial amounts of alkaline or acid pH modifiers, sufficient to change the pH.

4,515,689

CLASSIFYING MEANS

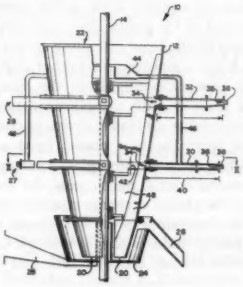
Jacobus L. Vivier, Verkeerdevlei, South Africa, assignor to Clasicon (Proprietary) Limited, Bloemfontein, South Africa

Filed Dec. 2, 1983, Ser. No. 557,545

Claims priority, application South Africa, Dec. 3, 1982, 82/8920

Int. Cl.³ B03B *5/58;* **B04B** *1/10*

U.S. Cl. 209—453 **25 Claims**



1. A centrifugal classification apparatus for separating particulate solids in a fluid mixture into fractions having common physical characteristics, the apparatus including

an open-ended hollow shell rotatable about a longitudinal rotation axis and having an inlet opening at one axial end for receiving the fluid mixture to be separated, an outlet opening at its other axial end, and a wall extending between the inlet opening and the outlet opening;

a discharge aperture in the shell intermediate its inlet and outlet openings through which the solids may pass;

a collecting compartment fast with the shell and located about the discharge aperture for collecting a fraction of the solids having common physical characteristics, the compartment extending radially outwardly from the shell and having a radial depth greater than the maximum longitudinal width of the aperture and a closable discharge orifice at its radially outer end;

a flow causing means for causing fluid mixture fed into the shell at its inlet opening to flow along the wall of the shell towards and past the discharge aperture and towards the outlet opening;

a valve at the orifice for controlling discharge of solids from the compartment;

a flushing means for introducing a counter-current flushing fluid into the collecting compartment between its discharge orifice and the aperture; and

a splitting member extending circumferentially across the discharge aperture and projecting inwardly from the wall of the shell, so that the aperture is divided into an upstream aperture, longitudinally closer to the inlet opening, and a downstream aperture, longitudinally closer to the outlet opening.

4,515,690

FUEL SUPPLY SYSTEM FOR DIESEL ENGINES

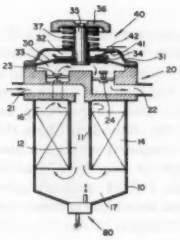
Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jul. 19, 1983, Ser. No. 514,796

Claims priority, application Japan, Aug. 6, 1982, 57-120147[U]; Aug. 31, 1982, 57-131383[U]; Mar. 10, 1983, 58-34795[U]

Int. Cl.³ B01D *27/10*

U.S. Cl. 210—90 **24 Claims**



1. Apparatus for use in a fuel supply system supplying controlled amounts of fuel into a diesel engine, said fuel supply system including a source of fuel, a fuel injection pump, and a fuel passage connected between said fuel source and said fuel injection pump, said apparatus comprising:

(a) a filter for filtering out contaminants from fuel, said filter positioned in said fuel passage upstream of said fuel injection pump;

(b) a priming pump for priming fuel to said fuel injection pump, said priming pump including:

a casing;

a priming pump diaphragm provided in said casing to form first and second chambers on opposite sides of said diaphragm, said first chamber communicating with the atmosphere, said second chamber forming a part of said fuel passage between said filter and said fuel injection pump, said priming pump diaphragm being moveable to direct fuel from said second chamber into the fuel injection pump; and

resilient means for urging said diaphragm towards said first chamber;

valving means for permitting fuel flow only in a direction (1) from said filter to said second chamber and (2) from said second chamber to said fuel injection pump;

(c) a switch operable between first and second states in response to movement of said priming pump diaphragm caused by variations in pressure in said second chamber, said switch being in said first state when the pressure in said second chamber is above a predetermined value, said

switch changing to said second state when the pressure in said second chamber decreases to said predetermined pressure value; and

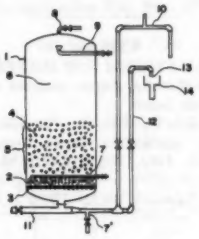
(d) an indicator responsive to said second state of said switch for providing an indication informing that said filter is clogging.

4,515,691

FILTRATION APPARATUS

Hiroaki Ida, Uji; Masahiro Fujii, Kyoto, and Toshio Haruta, Nagaokakyo, all of Japan, assignors to Unitika, Ltd., Hyogo, Japan

Filed Jun. 25, 1982, Ser. No. 392,361
Claims priority, application Japan, Jul. 13, 1981, 56-109838
Int. Cl.³ B01D *29/08*
U.S. Cl. 210—274 **13 Claims**



1. A filtration apparatus comprising a filter tank, a support at least at a lower interior portion of the filter tank, a filter medium layer formed above the support and comprising accumulated but unconnected lumps of interlocked short fibers 5 to 50 mm in fiber length, said lumps being composed without a binder connecting the individual fibers thereof, the filter medium layer being composed without a binder interconnecting the individual lumps so that there is no binder in the spaces between the lumps, a filter medium moving zone provided within the filter tank above the support and having a height at least one half the thickness of the filter medium layer for rendering the fiber lumps free to move therein independently of each other during washing of the filter medium layer, air injecting means disposed under the filter medium layer, prefilt inlet means disposed at one of an upper portion of the filter tank and a lower portion thereof, and filtrate outlet means disposed at the other of the filter tank upper portion and lower portion.

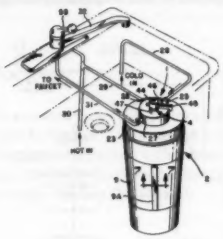
4,515,692

WATER FILTER

James W. Chandler, and William D. Chandler, both of Ashland, Ohio, assignors to Water Soft, Inc., Ashland, Ohio

Filed May 6, 1983, Ser. No. 492,359
Int. Cl.³ B01D *23/14, 23/24*
U.S. Cl. 210—278 **19 Claims**

12. A water filter adapted to be installed in separate cold and hot water supply lines comprising a housing containing a granular activated carbon filtration bed, valve means on said housing to control water flow through said filtration bed, said valve means including a valve body and a movable valve disk cooperating with said valve body, said valve body having three ports only, the first port being adapted for connection to and positioning in said cold water supply line, the second port being adapted for connection to a branch of the hot water supply line and the third port being adapted for connection to an effluent water line leading from the housing, said valve disk having flow control means therein selectively cooperating with said three ports to permit cold water from the cold water line to flow through the filtration bed in one direction and then out the effluent water line when said valve disk is in a first position for service and alternatively to permit hot water from the hot water branch to flow through the filtration bed in an



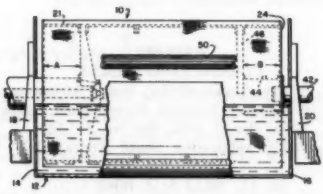
opposite direction and then out the effluent water line when said valve disk is moved to a second position for backwashing.

4,515,693

FIBERGLASS-REINFORCED SOLID PLASTIC DRUM

Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 20, 1981, Ser. No. 294,461
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—402 **2 Claims**



1. A rotary drum filter comprising: a fiberglass-reinforced plastic drum having a plastic deck, a first plastic head extending across one end of the plastic deck and supporting said one end and a second plastic head extending across the other end of the plastic deck and supporting said other end; a single central coaxial plastic pipe extending from the first plastic head a predetermined distance into the plastic drum; a plurality of radial fiberglass-reinforced plastic drainage conduits longitudinally-separated from the first plastic head a predetermined distance extending from the fiberglass-reinforced plastic deck to the single central coaxial plastic pipe, the longitudinal separation between the plastic drainage conduits and the first plastic head and the dimensions of the first plastic head being such that the first plastic head is strong enough to withstand the radial force, drive torque, and hydraulic end force.

4,515,694

CABLE LIFTING MECHANISM FOR SEDIMENTATION DEVICE

Ralph B. Haymore, and Heinz W. Winter, both of Salt Lake City, Utah, assignors to Envirotech Corporation, Salt Lake City, Utah

Filed May 2, 1983, Ser. No. 490,741
Int. Cl.³ B01D *21/18*
U.S. Cl. 210—531 **26 Claims**

1. A lifting mechanism for a raking structure in a solids-liquid sedimentation tank comprising:

a fixed center column adapted to extend from the bottom of a sedimentation tank to above the upper level of liquid to be contained in said tank;

a concentric movable column in telescoping relation with

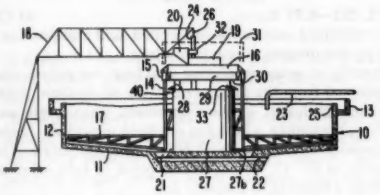
said center column, said movable column being adapted to mount said raking structure; and

means for moving said movable column telescopically with respect to said center column, said means including:

a first series of sheaves fixed to said movable column;

a second series of sheaves in fixed relation with said fixed center column;

drum means in fixed relation to one of said columns;



a continuous cable extending threadably between each of the sheaves in said first and second series of sheaves; and

means including said drum means for pulling and shortening the effective span length of said cable between said first and second series of sheaves to raise said movable column with respect to said fixed column.

4,515,695

EXTRACTION OF SUBSTANCES FROM AQUEOUS SOLUTION

John L. Knupp, Jr., Newark, Del., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 28, 1983, Ser. No. 555,487
Int. Cl.³ A23F *3/20*
U.S. Cl. 210—634 **2 Claims**

1. In a process for extracting solute from an aqueous solution by contacting the solution with an immiscible solvent in which said solute is soluble, the improvement which comprises contacting said aqueous solution containing a solute that is insoluble in 1,1,2-trichloro-1,2,2-triflurorethane with a mixture of 10 to 90 wt % monochlorodifluoromethane and 90 to 10 wt % 1,1,2-trichloro-1,2,2-trifluoroethane at a pressure sufficient to maintain the mixture in the liquid state, allowing the contacted liquids to return to a quiescent state after said contact thus forming separate liquid layers, separating the liquid layers, vaporizing the monochlorodifluoroethane in the fluorocarbon solvent phase by reducing pressure thereby causing the solute to precipitate or form a second liquid layer, and separating said solute from the 1,1,2-trichloro-1,2,2-trifluoroethane.

4,515,696

TREATMENT OF SOLUTIONS TO FACILITATE THE REMOVAL OF FERRIC IRON THEREFROM

Ian G. Matthew, Dynnyrne; Robert V. Pammenter, and Mervyn G. Kershaw, both of Lindisfarne, all of Australia, assignors to Electrolytic Zinc Company of Australasia Limited, Victoria, Australia

Filed Mar. 9, 1983, Ser. No. 473,526
Claims priority, application Australia, Mar. 24, 1982, PF3282
Int. Cl.³ C02F *1/54*
U.S. Cl. 210—713 **28 Claims**

1. A process for treatment of an acidic sulphate solution containing ferric iron and at least one non-ferrous metal, prior to removal of ferric iron therefrom, characterised by:

(a) adding at least one neutralizing agent in amounts such that the total amount added lies in the range X_1 to X_2 grams per liter of the said solution, where—

$$X_1[(A-3.0)+0.088\ (F_1+F_2)]/N,$$

$$X_2[(A-0.1)+2.20\ (F_1+F_2)]/N,$$

A = acidity (expressed as grams per liter) of the said solution,

F_1 = ferric iron (grams per liter) in the said solution,

F_2 = ferric iron (grams per liter) dissolved from the neutralizing agent or agents added during neutralization, and

N = the weighted average amount of acid which can be neutralized by one gram of the neutralizing agent or agents added during neutralization, and

(b) separating off from the solution any residue or undissolved neutralizing agent remaining after neutralization, thereby producing a solution possessing a negative acidity and still containing substantially all the dissolved ferric iron in solution and subsequently removing ferric iron with the generation of less acid compared to that generated from solutions partially neutralized according to the prior art.

4,515,697

METHOD FOR FLOCCULATING MICROSCOPIC PARTICLES IN SUSPENSION IN A LIQUID AND APPLICATION TO THE COLLECTION OF PHYTOPLANKTON MICROALGAE AND ZOOPLANKTON AND FOR THE PURIFICATION OF USED WATER

Samuel Elmaleh, Clapiers, and Alain D. Grasmick, Montferrier, both of France, assignors to David Gozal, Madrid, Spain

Filed Jan. 27, 1983, Ser. No. 461,628
Int. Cl.³ B01D *23/10*
U.S. Cl. 210—768 **14 Claims**

1. Method of treating microscopic particles comprising micro-organisms in suspension in a liquid, comprising: passing a first liquid containing said microscopic particles in suspension through a fixed granular layer up to partial or complete clogging of said granular material by said microscopic particles; passing a second liquid through said fixed layer to be partially unclogged by the passing of said second liquid therethrough; said second liquid moving in the same direction as the first liquid, but at a higher speed so as to recover below said layer in the direction of passage of said liquid, flocculated aggregates of said microscopic particles and an outflow of a liquid which is freed of said particles.

4,515,698

LIQUID CLARIFYING APPARATUS AND METHODS

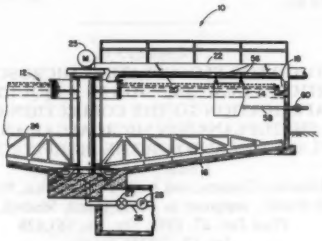
William E. Stewart, 12 Brow Hill Rd., Somers, Conn. 06071

Filed Jan. 23, 1984, Ser. No. 572,765
Int. Cl.³ B01D *21/06*
U.S. Cl. 210—802 **24 Claims**

1. The combination comprising a liquid clarifying apparatus and at least one clarifier module, said liquid clarifying apparatus having a tank containing waste effluent, means for supplying waste effluent to said tank, means for discharging clarified liquid from the tank, and means for removing sludge from a lower portion of the tank, said one clarifier module disposed

within said tank and having a settling region partially defined by a plurality of parallel spaced apart and vertically inclined plates, means defining a clarified effluent chamber forward of said settling region, means for separating said chamber from said region, means providing fluid communication through said separating means between each said settling region and a rear portion of said chamber, a weir within said chamber and separating a front portion of said chamber from said rear portion thereof, means for maintaining said clarifier module within said tank with said weir disposed below the level of the waste effluent in said tank, and means for withdrawing clarified effluent from said front portion and discharging it externally of said tank.

15. A method for improving the performance of a liquid clarifying apparatus having a tank for receiving and containing



a quantity of waste effluent, said method comprising the steps of providing at least one clarifier module having a settling region partially defined by a plurality of parallel spaced apart and vertically inclined plates, means defining a clarified effluent chamber forward of said settling region, means for separating said chamber from said separating region, means providing fluid communicating through said separating means between said settling region and the rear portion of said chamber, and a weir within said chamber and separating a front portion of said chamber from said rear portion thereof, positioning said one module within said tank with said weir disposed below the level of liquid within said tank, withdrawing clarified effluent from the front portion of said chamber, and discharging the clarified effluent withdrawn from said front portion externally of said tank.

4,515,699

CHEMICALLY CLEANING DRILLING/COMPLETION/PACKER BRINES

John E. Oliver, Jr., 3752 Del Monte, Houston, Tex. 77019, and Arnold M. Singer, 3042 Las Palmas, Houston, Tex. 77027

Continuation-in-part of Ser. No. 310,653, Oct. 13, 1981, Pat. No. 4,456,537. This application Dec. 17, 1982, Ser. No. 450,519

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.³ E21B *43/00*; C09K *7/02*

U.S. Cl. 252—8.55 R **6 Claims**

1. In a process to produce a solid-free aqueous well fluid of high density type having one or more of the sodium, calcium or zinc salts with chloride and bromide, and mixtures thereof, including the steps of:

(a) introducing in small effective amounts an aliphatic alcohol with between 5 to 8 carbon atoms and a surface active chemical aid into the fluid; and

(b) seaparating the agglomerated solids from the fluid before introduction into a well bore in a solids free state, wherein the surface active chemical aid includes a surfactant having a molecular weight in the range of from about 150 to about 500 with predominant hydrophobic characteristics and the surfactant is selected from a group consisting of aliphatic amines, amides and aliphatic amine oxides with the amine and amide and amine oxide constituents having an alkyl group with between 8 and 18 carbon atoms, the improvement comprising in step (a) employing as the alcohol 2-ethyl hexanol.

4,515,700

GELLED ACID COMPOSITION

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1983, Ser. No. 487,367

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—8.55 R **13 Claims**

1. A stabilized polysaccharide gelled acid composition produced by the process which comprises:

(a) heating an aqueous solution of at least one polysaccharide sellected from the group consisting of xanthan, dextrans, levans, pullulans, glucans, mannans, glucosylglucan and phosphomannan which has not been previously heated to temperatures above about 60° C. at a temperature in the range of 60° C. to the boiling point of said solution for about 5 minutes to 2 hours; and

(b) thereafter adding from about 0.4 to about 60 weight percent of at least one acid selected from a non-oxidizing mineral acid of the group consisting of hydrochloric acid, hydrofluoric acid and phosphoric acid or a C_1 to C_6 organic acid.

4,515,701

LOW COST, BRINE TOLERANT SULFONATE AND SULFATE SURFACTANTS HAVING 1,3-DIHYDROCARBOXY-2-PROPYL HYDROPHOBIC TAILS

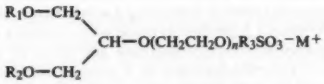
Dennis H. Hoskin, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 413,591, Aug. 31, 1982, Pat. No. 4,446,079. This application Feb. 24, 1984, Ser. No. 583,513

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **10 Claims**

1. A fluid for the secondary recovery of oil comprising brine and a surfactant which is a compound of the formula



(VI)

where R_1 and R_2 are the same or different and are C_1–C_{15} hydrocarbyl, R_3 is C_{0-5} alkyl, M is a cation and n is a rational number from 2 to 6 said surfactant being present in said brine in an amount sufficient to enhance secondary or tertiary recovery of oil from subterranean reservoirs.

4,515,702

HEAT-RESISTANT SILICONE FLUID COMPOSITIONS

Shigeru Mori, Gunma; Yoshiaki Kudo, Tokyo, and Satoshi Kuwata, Gunma, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,455

Claims priority, application Japan, Apr. 12, 1983, 58-64095

Int. Cl.³ C10M *1/50*

U.S. Cl. 252—49.6 **2 Claims**

1. A heat-resistant silicone fluid composition which comprises:

(a) 100 parts by weight of an organopolysiloxane represented by the average unit formula

$$R_a^1SiO_{\frac{4-a}{2}},$$

in which R^1 is an alkyl group or a phenyl group and a is a positive number from 0.95 to 2.25, and having a viscosity in the range from 10 to 1,000,000 centistokes at 25 ° C.; and

(b) from 0.01 to 5 parts by weight of an aromatic amino-modified organopolysiloxane represented by the general formula

$$R^2-O\left(SiR_2^1-O\right)_p R^2$$

or

$$R_3^1Si-O\left(SiR_2^1-O\right)_q\left(SiR^1-O\right)_r SiR_3^1,$$
$$\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\quad O-R^2$$

in which R^1 has the same meaning as defined above, R^2 is an aromatic amino-substituted group selected from the class consisting of 4-(p-semidino)phenyl, 4-(α-naphthylamino)phenyl and 4-(β-naphthylamino)phenyl groups, p is a positive integer from 1 to 50 inclusive, q is zero or a positive integer not larger than 47 and r is a positive integer from 1 to 10 inclusive with the proviso that q+r is in the range from 1 to 48.

4,515,703

ARTICLE CARRYING ACTIVE MATERIAL

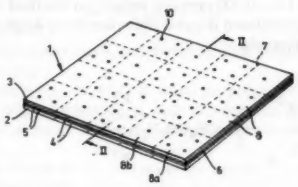
Zia Haq, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,500

Claims priority, application United Kingdom, Jun. 1, 1981, 8116743; Jan. 11, 1982, 8200647

Int. Cl.³ C11D *17/00*

U.S. Cl. 252—92 **14 Claims**



1. An article in the form of a substrate carrying a releasable active material, said article comprising first and second substrates each comprising an outer layer of a paper or nonwoven fabric completely surrounding and having laminated thereto or coated thereon an inner layer of active liquid-impermeable thermoplastic material, said inner layers being so bonded together as to create a plurality of compartments therebetween, at least some of said compartments containing said releasable active material and each of said compartments carrying active material being provided with one or more perforations having diameters within the range of from 0.2 to 1.2 mm in one or each of the substrate walls defining said compartments, the distribution of perforations being within the range of from 0.5 to 3/cm$_2$, said perforations providing the means for release of said releasable active material.

4,515,704

POURABLE NON-SEDIMENTING AQUEOUS BASED DETERGENT COMPOSITION HAVING AN ORGANIC LAMELLAR STRUCTURAL COMPONENT

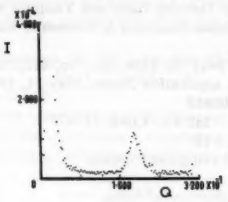
Brian J. Akred, Whitehaven; Edward T. Messenger, Workington, and William J. Nicholson, Whitehaven, all of United Kingdom, assignors to Albright & Wilson Limited, Oldbury, England

Filed Feb. 4, 1983, Ser. No. 464,019

Claims priority, application United Kingdom, Feb. 5, 1982, 8203398; Apr. 13, 1982, 8210670; Jul. 2, 1982, 8219227; Dec. 23, 1982, 8236664

Int. Cl.³ C11D *1/12, 7/14, 7/16*

U.S. Cl. 252—135 **31 Claims**



1. A Pourable, Non-sedimenting, aqueous based detergent composition containing Active Ingredient and Builder, having at least 25% by weight Pay Load and comprising a first, predominantly aqueous, liquid phase, containing dissolved surfactant desolubilising Electrolyte, at least one Dispersed solid phase comprising said Builder, the concentration of said dissolved Electrolyte being sufficient to provide at least one other phase, comprising more than 25% by weight of the Active Ingredient Interspersed with said first phase, but separable therefrom by centrifuging at 800 times normal Earth gravity for 17 hours at 25° C., the proportion of water being sufficient to provide a Pay Load which is greater than the threshold for non-sedimentation but which is below the ceiling for Pourability.

4,515,705

COMPOSITIONS CONTAINING ODOR PURIFIED PROTEOLYTIC ENZYMES AND PERFUMES

Robert W. Moeddel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 551,378, Nov. 14, 1983, abandoned. This application Mar. 20, 1984, Ser. No. 591,622

Int. Cl.³ C11D *7/42, 3/50*

U.S. Cl. 252—174.12 **10 Claims**

1. A composition of matter comprising:

(a) a proteolytic enzyme in an amount sufficient to provide an activity of from about 0.005 to about 0.1 Anson units per gram of composition, said enzyme having no detectable odor at a concentration of less than about 0.002 Anson units per gram per liter of distilled water; and

(b) from about 0.001% to about 2% by weight of a perfume selected from the group consisting of phenyl ethyl alcohol, linalool, geraniol, citronellol, cinnamic alcohol, iso bornyl acetate, benzyl acetate, para-tertiary-butyl cyclohexyl acetate, linalyl acetate, dihydro-nor-dicyclopentadienyl acetate, dihydro-nor-dicyclopentadienyl propionate, amyl salicylate, benzyl salicylate, para-iso-propyl alpha-octyl hydrocinnamic aldehyde, hexyl cinnamic aldehyde, hydroxy citronellal, heliotropin, anisaldehyde, citral, dextro limonene, coumarin, ionone gamma methyl, methyl beta naphthyl ketone, gamma undecalactone, eugenol, musk xylol, 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyrane, 4-acetyl-6-tertiarybutyl-1,1-dimethyl indan, 6-acetyl-1,1,3,4,4,6-hexamethyl tetrahydro naphthalene, beta naphthyl ethyl

ether, methyl eugenol, methyl cedrenyl ketone, patchouli, lavandin, geranyl nitrile, alpha ionone, alpha beta ionone, benzyl iso eugenol, amyl cinnamic aldehyde, beta gamma hexenol, orange CP, orthotertiary-butyl cyclohexyl acetate, 2-methyl-3-(para-iso-propylphenyl)propionaldehyde, trichloro methyl phenyl carbinyl acetate, nonane diol-1,3-acetate, methyl dihydro jasmonate, phenoxy ethyl iso butyrate, citronella, citronellal, citrathal, tetrahydromuguol, ethylene brassylate, musk ketone, musk tibetine, phenyl ethyl acetate, oakmoss 25%, hexyl salicylate, eucalyptol, and mixtures thereof.

4,515,706

RARE EARTH OXYFLUORIDE BARIUM FLUORIDE HALIDE PHOSPHOR

Takeshi Takahara; Tsutomu Ishii, and Yasuhiro Shirakawa, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed May 30, 1984, Ser. No. 615,370

Claims priority, application Japan, May 31, 1983, 58-94808; Jun. 8, 1983, 58-100869

Int. Cl.³ C09K *11/477*

U.S. Cl. 252—301.4 H **4 Claims**

1. A phosphor having the formula

$$aReOF.(1-a)Ba_{(1-x)}M_xFX:Eu_y$$

where:

Re is one element selected from the group consisting of Lu and Y;

M is at least one element selected from the group consisting of Be, Mg, Ca, Sr, Zn, and Cd;

X is at least one element selected from the group consisting of Cl, Br, and I;

a is greater than zero but less than or equal to 0.6;

x is in the range from 0 to 0.5, inclusive;

y is in the range from 10^{-6} to 2×10^{-1}, inclusive; and where "a" is an amount such that the phosphor exhibits a higher luminous intensity than said phosphor absent ReOF when stimulated by light having a wavelength of 550 nm after being exposed to X-ray radiation.

4,515,707

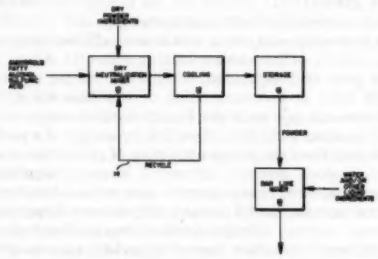
INTERMEDIATE PRODUCT FOR USE IN PRODUCING A DETERGENT BAR AND METHOD FOR PRODUCING SAME

Burton Brooks, Bellevue, Wash., assignor to The Chemithon Corporation, Seattle, Wash.

Filed Jun. 27, 1983, Ser. No. 508,131

Int. Cl.³ C11D *3/065, 11/021, 1/12*

U.S. Cl. 252—368 **19 Claims**



1. A method for producing a laundry detergent bar containing (a) a salt of a sulfuric acid selected from the group consisting of $C_{8\text{-}20}$ fatty alcohol sulfuric acids and ethoxylated $C_{8\text{-}20}$ fatty alcohol sulfuric acids and (b) a plurality of other ingredients at least some of which are provided in dry, powdered form, said method comprising the steps of:

producing, by a sulfation reaction, an anhydrous sulfuric acid selected from the group consisting of $C_{8\text{-}20}$ fatty alcohol sulfuric acids and ethoxylated $C_{8\text{-}20}$ fatty alcohol sulfuric acids;

dry neutralizing said anhydrous sulfuric acid with a neutralizing agent comprising dry, powdered sodium carbonate to produce a neutralized product in the form of a dry, free-flowing powder containing a salt of said sulfuric acid, said salt being stable during storage;

said dry neutralizing step comprising mixing said anhydrous sulfuric acid with a laundry detergent bar ingredient which is in dry, powdered form and avoiding free water in the neutralized product;

said neutralizing step being performed with sufficient immediacy, following the completion of said sulfation reaction, to prevent the breakdown of said anhydrous sulfuric acid;

storing said powder formed in said dry neutralizing step;

subsequently removing said neutralized powder from storage;

and then subjecting said neutralized powder to further processing into a detergent bar after the neutralized powder has been removed from storage.

4,515,708

CORROSION INHIBITORS

John A. Haslegrave, and Daniel S. Sullivan, both of Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

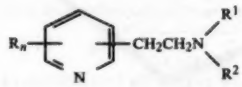
Filed Nov. 16, 1983, Ser. No. 552,402

Claims priority, application United Kingdom, Nov. 24, 1982, 8233563

Int. Cl.³ C09K *3/00*

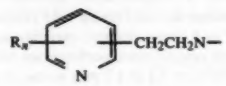
U.S. Cl. 252—390 **8 Claims**

1. A method of inhibiting corrosion of metals, which method comprises treating a metal containing system where metals are susceptible to corrosion with a corrosion-inhibiting amount ranges from 1 to 10,000 ppm (by weight) of the fluid within the system of a substituted β-pyridylethylamine or a salt thereof of the general formula:



(I)

wherein R is an alkyl, aryl, aralkyl, alkaryl, halo or amino group or a group —COX where X is hydrogen, alkyl, aryl, hydroxy, alkoxy, aryloxy, amino or halo group, n is zero or an integer from 1 to 4, and R^1 and R_2, which may be the same or different, each represent a hydrogen atom, an optionally substituted hydrocarbyl radical, an alkylamino radical, a heterocyclic radical or a group

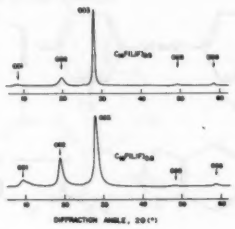


or R1 and R2 with the intervening nitrogen atom together represent a saturated or unsaturated heterocyclic ring optionally containing one or more additional heteroatoms.

4,515,709
TERNARY INTERCALATION COMPOUND OF A GRAPHITE WITH AN ALKALI METAL FLUORIDE AND FLUORINE, A PROCESS FOR PRODUCING THE SAME, AND AN ELECTRICALLY CONDUCTIVE MATERIAL COMPRISING THE TERNARY INTERCALATION COMPOUND

Nobuatsu Watanabe; Tsuyoshi Nakajima, both of Kyoto, and Masayuki Kawaguchi, Wakayama, all of Japan, assignors to Central Glass Co., Ltd., Ube, Japan

Filed Mar. 9, 1983, Ser. No. 474,202
Claims priority, application Japan, Sep. 10, 1982, 57-156600
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—509 **5 Claims**



1. A ternary intercalation compound of a graphite with an alkali metal fluoride and fluorine represented by the formula $C_xF(MF)_y$ wherein M is an alkali metal selected from the group consisting of Li, Na, K, Rb and Cs, x is about 2 to about 100 and y is about 0.001 to about 0.80.

4,515,710
IN-MOLD COATING COMPOSITION

David S. Cobbledick, Kent, Ohio, assignor to GenCorp Inc., Akron, Ohio

Continuation-in-part of Ser. No. 514,415, Jul. 18, 1983, , which is a division of Ser. No. 435,026, Oct. 25, 1982, Pat. No. 4,414,173, which is a continuation-in-part of Ser. No. 316,572, Nov. 2, 1981, abandoned. This application Apr. 5, 1984, Ser. No. 597,149
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—511 **10 Claims**

1. A composition useful as a thermosetting coating composition comprising

(a) 100 parts by weight of at least one polymerizable epoxy based oligomer having at least two acrylate groups and a weight average molecular weight of from about 500 to 1,500,

(b) from about 80 to 160 parts by weight of at least one copolymerizable ethylenically unsaturated monomer,

(c) from about 10 to 120 parts by weight of at least one copolymerizable monoethylenically unsaturated compound having —CO— group and a —NH_2, —NH— and/or —OH group,

(d) from about 20 to 90 parts by weight of carboxylated polyvinyl acetate having an acid number of from about 1.5 to 4,

(e) from about 0.2 to 5 parts by weight of at least one zinc salt of a fatty acid having at least 10 carbon atoms,

(f) from about 0.01 to 1.0 part by weight of at least one accelerator for a peroxide initiator,

(g) from about 5 to 30 parts by weight of conductive carbon black,

(h) from about 50 to 155 parts by weight of a filler,

(i) a copolymerizable or cocurable diacrylate compound having a weight average molecular weight of from about 250 to 5,000 and being at least one polyoxyalkylene glycol oligomer having two acrylate groups and

(j) at least one copolymerizable tri or tetra acrylate having an average molecular weight of from about 250 to 1,000, the total of (i) and (j) being from about 5 to 120 parts by weight and the weight ratio of (i) to (j) being from about 10:1 to 1:10 and

(k) at least one calcium salt of a fatty acid having at least 10 carbon atoms in an amount of from about 0.2 to 5 parts by weight.

4,515,711
ALKENOXY OCTADIENES AS ODORANTS

Alan J. Chalk, Kinnelon, and Kenneth L. Purzycki, Lake Parsippany, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Sep. 27, 1982, Ser. No. 423,901
Int. Cl.³ A61K *7/46*
U.S. Cl. 252—522 R **4 Claims**

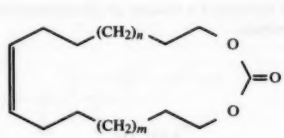
1. A fragrance composition comprising an olfactorily effective amount of the compound 1-(2-propenoxy)-2,7-octadiene and at least one other olfactory substance.

4,515,712
MACROCYCLIC CARBONATES AND ORGANOLEPTIC USES THEREOF

Wilhelmus J. Wiegers, Red Bank, N.J.; Augustinus G. Van Loveren, Rye, N.Y.; Marie R. Hanna, Hazlet, N.J.; Domenick Luccarelli, Jr., Neptune, N.J.; David R. Bowen, Red Bank, N.J., and Manfred H. Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 511,909, Jul. 8, 1983,. This application Jun. 22, 1984, Ser. No. 623,448
Int. Cl.³ A61K *7/46*; C11B *9/00*
U.S. Cl. 252—522 R **2 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed polymer comprising the step of adding to said consumable material, an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein n and m are the same or different and each represents an integer of from 1 up to 8.

4,515,713
DECARBOXYLATION OF ROSIN ACIDS

Lawson G. Wideman, Tallmadge, and Joseph A. Kuczkowski, Munroe Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1984, Ser. No. 568,965
Int. Cl.³ C09F *1/00, 5/00*
U.S. Cl. 260—106 **10 Claims**

1. An extender oil for rubber prepared by decarboxylating wood rosin acids by heating at temperatures from 300° C. to 450° C. in the presence of high sulfur tall oil rosin, dark thermoplastic resins derived from crude wood rosin, fatty acids, and organic and inorganic sulfides to accelerate the decarboxylation.

4,515,714

METHOD FOR PURIFICATION OF HEPATITIS B VIRUS SURFACE ANTIGEN

Tetsuo Kawahara; Hiroshi Mizokami; Kyosuke Mizuno, and Sadao Susumi, all of Kumamoto, Japan, assignors to Juridical Foundation, The Chemo-Semo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Filed Mar. 6, 1984, Ser. No. 586,702

Claims priority, application Japan, Mar. 9, 1983, 58-39837; May 28, 1983, 58-94495

Int. Cl.³ A61K *39/12, 39/00, 39/42;* **C07G** *7/00*

U.S. Cl. 260—112 R **8 Claims**

1. In a method for the purification of hepatitis B virus surface anitgen comprising subjecting a heptitis B virus surface anitgen-containing solution to column chromatography, the improvement comprising using a sulfuric acid ester of a cross-linked polysaccharide or cellulose as a gel for the chromatography, said sulfuric acid ester being prepared by treating a gel of crosslinked polysaccharide or cellulose with a sulfating agent in an organic solvent.

4,515,715

L-ALANYL-D-ISOGLUTAMINE ADAMANTYLAMIDE

Martin Flegel; Milan Krojidlo; Jirí Kolínský; Karel Masek, and Jaroslav Seifert, all of Prague, Czechoslovakia, assignors to SPOFA, spojene podniky pro zdratvonickou vyrobu, Prague, Czechoslovakia

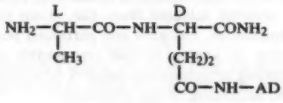
Filed Jun. 29, 1983, Ser. No. 509,293

Claims priority, application Czechoslovakia, Jun. 29, 1982, 4908-82

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. L-Ananyl-D-isoglutamine adamantylamide of the formula



wherein AD represents a residue of adamantane bound in the number 1 position.

4,515,716

2,6-DIAMINOPYRIDINE-BASED AZO DYES FOR CELLULOSE-CONTAINING FIBERS

Toshio Niwa, and Toshio Hihara, both of Kanagawa, Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

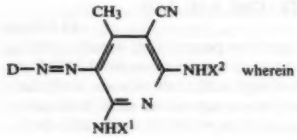
Filed Sep. 3, 1982, Ser. No. 414,733

Claims priority, application Japan, Sep. 16, 1981, 56-145943; Dec. 23, 1981, 57-208498; Feb. 9, 1982, 57-19289

Int. Cl.³ C09B *62/06, 62/085, 62/09;* **D06P** *1/382*

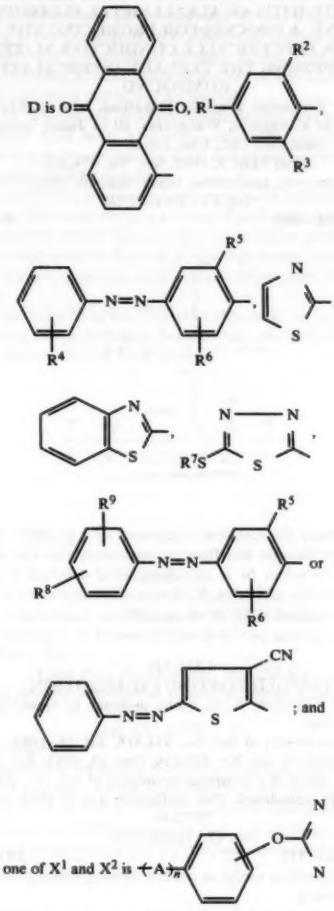
U.S. Cl. 534—635 **3 Claims**

1. A diaminopyridine-based azo dye for cellulose-containing fibers, represented by the following formula:



wherein

-continued



one of X^1 and X^2 is $+A\rightarrow_n$ and the other is hydrogen, phenyl, benzyl, allyl, or alkyl which are unsubstituted or substituted by hydroxyl or lower alkoxy (wherein

A is methylene, ethylene, propylene, or 1,3-butylene;

n is 0 or 1;

Y^1 and Y^2, which are the same or different, are hydrogen, alkyl, alkenyl, cyclohexyl, aryl, or aralkyl which are unsubstituted or substituted by cyano, hydroxy, lower alkoxy, or dialkylamino, or Y^1 and Y^2 together form a 5- or 6-membered heterocyclic ring (NY^1Y^2) containing one nitrogen, the total number of carbon atoms of Y^1 and Y^2 being 18 or less:

R^1 is nitro, cyano, methylsulfonyl, phenylsulfonyl, mono-lower alkylaminosulfonyl, di-lower alkylaminosulfonyl, acetyl, or benzoyl;

R^2 and R^3, which are the same or different, are hydrogen, trifluoromethyl, halogen, or cyano;

R^4 is hydrogen, lower alkyl, mono- or di-lower alkylaminosulfonyl, mono/or di-lower alkylcarbamoyl, or acetylamino;

R^5 *and R6*, which are the same or different, are hydrogen, halogen, or lower alkyl;

R^7 is lower alkyl;

R^8 is trifluoromethyl, or halogen; and R^9 is hydrogen, or halogen).

4,515,717

THIA-AZA COMPOUNDS WITH A β-LACTAM RING

Jacques Gosteli, Basel; Ivan Ernest, Birsfelden, both of Switzerland, and Robert B. Woodward, Cambridge, Mass., assignors to Ciba Geigy Corporation, Ardsley, N.Y.

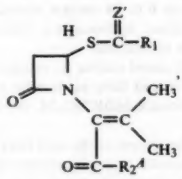
Division of Ser. No. 353,288, Mar. 1, 1982, , which is a division of Ser. No. 902,639, May 4, 1978, Pat. No. 4,331,676. This application Sep. 24, 1982, Ser. No. 423,351

Claims priority, application Luxembourg, May 9, 1977, 77306

Int. Cl.³ C07D *205/08, 401/12, 405/12, 409/12*

U.S. Cl. 260—239 A **2 Claims**

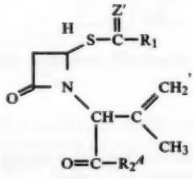
1. Compounds of the formula



(XI)

in which Z′ represents oxygen, sulphur or a methylidene group optionally substituted by one or two substituents selected from the group consisting of lower alkyl, cycloalkyl, cycloalkyl-lower alkyl, phenyl, phenyl-lower alkyl and esterified carboxy, R_1 represents hydrogen, lower alkyl optionally mono-substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, lower alkylthio, carbamoyl, cyano, nitro, amino optionally mono- or di-substituted by lower alkyl, lower alkyleneamino or amino acylated by acetyl, tert.-butoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl or phenoxyacetyl; protected carboxyl; aminocarbonyl optionally mono- or di-substituted by lower alkyl; cycloalkyl; cycloalkyl-lower alkyl; phenyl; naphthyl; phenyl-lower alkyl; phenyl, naphthyl or phenyl-lower alkyl mono-substituted by lower alkyl, lower alkoxy, halogen, nitro, amino or di-lower alkylamino; pyridyl; thienyl; furyl; pyridyl-lower alkyl; thienyl-lower alkyl; furyl-lower alkyl; lower alkylthio; lower alkenylthio; cycloalkylthio; cycloalkyl-lower alkylthio; phenylthio; phenyl-lower alkylthio; or lower-alkylthio, lower alkenylthio, cycloalkylthio, cycloalkyl-lower alkylthio, phenylthio or phenyl-lower alkylthio mono-substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, lower alkylthio, carbamoyl, cyano, nitro, amino optionally mono- or disubstituted by lower alkyl, lower alkanoylamino or lower alkyleneamino; and $R^4{}_2$ together with the carbonyl group —C(=O)— to which it is attached represents a protected carboxyl group.

2. Compound of the formula



(Xa)

in which Z′ represents oxygen, sulphur or a methylidene group optionally substituted by one or two substituents selected from the group consisting of lower alkyl, cycloalkyl, cycloalkyl-lower alkyl, phenyl, phenyl-lower alkyl and esterified carboxy, R_1 represents hydrogen, lower alkyl optionally mono-substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, lower alkylthio, carbamoyl, cyano, nitro, amino optionally mono or di-substituted by lower alkyl, lower alkyleneamino or amino acylated by acetyl, tert.-butoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl or phenoxyacetyl; protected carboxyl; aminocarbonyl optionally mono- or di-substituted by lower alkyl; cycloalkyl; cycloalkyl-lower alkyl; phenyl; naphthyl; phenyl-lower alkyl mono-substituted by lower alkyl, lower alkoxy, halogen, nitro, amino or di-lower alkylamino; pyridyl-lower alkyl; thienyl-lower alkyl; furyl-lower alkyl; lower alkylthio; lower alkenylthio; cycloalkylthio; cycloalkyl-lower alkylthio; phenylthio; phenyl-lower alkylthio; or lower alkylthio, lower alkenylthio, cycloalkylthio, cycloalkyl-lower alkylthio, phenylthio or phenyl-lower alkylthio mono-substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, lower alkylthio, carbamoyl, cyano, nitro, amino optionally mono- or di-substituted by lower alkyl, lower alkanoylamino or lower alkyleneamino; and $R^4{}_2$ together with the carbonyl group —C(—O)— to which it is attached represents a protected carboxyl group.

4,515,718

AMIDINOUREAS

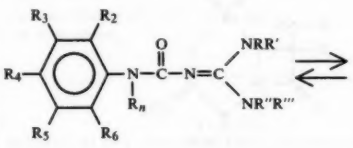
Julius Diamond, Morris Plains, N.J., and George H. Douglas, Malvern, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 118,826, Feb. 5, 1980, Pat. No. 4,353,842, which is a continuation of Ser. No. 942,247, Sep. 14, 1978, Pat. No. 4,204,000, which is a continuation-in-part of Ser. No. 787,673, Apr. 14, 1977, abandoned, which is a division of Ser. No. 558,187, Mar. 31, 1975, Pat. No. 4,060,635. This application Sep. 30, 1982, Ser. No. 429,917

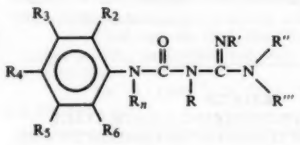
Int. Cl.³ C07D *223/02, 221/00*

U.S. Cl. 260—239 B **3 Claims**

1. An amidinourea compound of the formula I or its tautomeric form II when R is hydrogen:



I



II

where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are
hydrogen,
halo,
loweralkyl,
halologweralkyl,
nitro,
loweralkoxy,
hydroxy,
cyano,
haloloweralkoxy, or
loweralkylsulfonyl,
provided at least three of R_2, R_3, R_4, R_5 and R_6 are hydrogen;

R and R′ are hydrogen or loweralkyl;

R'' and R''' together with nitrogen form a 5–7 atom ring consisting of 3–6 carbon atoms and 1–2 nitrogen atoms;
R_n is hydrogen or loweralkyl provided at least one of R, R', R'' and R''' is other than hydrogen; and the non-toxic acid addition salts thereof.

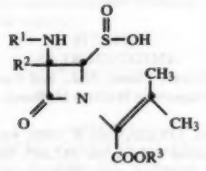
4,515,719

AZETIDINONE SULFINIC ACIDS FROM CEPHALOSPORIN SULFONES

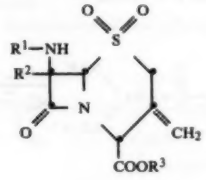
Lawrence J. McShane, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 22, 1983, Ser. No. 516,218
Int. Cl.³ C07D *205/08, 501/14, 403/12*
U.S. Cl. 260—239 A **4 Claims**

1. A process for preparing an azetidinone sulfinic acid of the formula



wherein:
R^1 is an acyl residue of a carboxylic acid;
R^2 is hydrogen, lower alkoxy or lower alkylthio; and
R^3 is a removable ester forming group; comprising reacting a 3-exomethylene sulfone of the formula



with activated zinc, magnesium, activated magnesium or magnesium amalgamated with mercury and a protonic acid in an unreactive solvent at a temperature of about 20° to about 100° C.

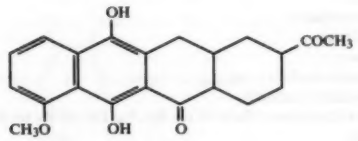
4,515,720

METHOD OF SYNTHESIZING A LATE-STAGE INTERMEDIATE TO 11-DEOXYDAUNORUBICIN AND 11-DEOXYADRIAMYCIN, AND TWO PRECURSORS TO THE OBJECT INTERMEDIATE

Frank M. Hauser, Portland, and Dipakranjan Mal, Beaverton, both of Oreg., assignors to Oregon Graduate Center for Study & Research, Beaverton, Oreg.

Filed Mar. 11, 1983, Ser. No. 474,491
Int. Cl.³ C07C *50/22, 50/36*
U.S. Cl. 260—351.1 **3 Claims**

1. The compound having the formula



4,515,721

PROCESS FOR THE PRODUCTION OF FATTY ACID ESTERS OF HYDROXYALKYL SULFONATE SALTS

Robert B. Login, Media; Ismail L. Walele, Aston, and Richard J. Otterson, Glenolden, all of Pa., assignors to Jordan Chemical Company, Folcroft, Pa.

Continuation-in-part of Ser. No. 424,281, Sep. 27, 1982, abandoned. This application Mar. 13, 1984, Ser. No. 589,170
Int. Cl.³ C07C *143/90;* **C11D** *1/28*
U.S. Cl. 260—400 **17 Claims**

1. In a process for preparing fatty acid esters of hydroxyalkyl sulfonic acid salts, said esters having the formula

$$RCOOR'SO_3M,$$

where:
R represents the aliphatic hydrocarbon residue of a fatty acid containing from 6 to 24 carbon atoms,
R' represents a divalent hydrocarbon radical containing from 2 to 4 carbon atoms, and
M represents an alkali metal cation, by condensing said fatty acid or a mixture of said fatty acids with a hydroxyalkyl sulfonate of the formula $HOR'SO_3M$, the steps comprising:
(a) heating a molecular excess of the said fatty acid with said hydroxylalkyl sulfonate, to a temperature of 200° to 250° C., in a substantially oxygen-free atmosphere for sufficient time to remove the water of condensation,
(b) quenching the hot crude reaction mixture resulting from step (a) by immersing said reaction mixture in a liquid which is at a temperature lower than said reaction mixture and in which said ester is substantially insoluble, but unreacted fatty acids are soluble, thereby to form a slurry wherein the solid phase comprises relatively pure ester of the above formula and the liquid phase comprises said quenching liquid and unreacted fatty acid, and
(c) separating the solid phase from the liquid phase of said slurry.

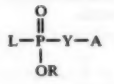
4,515,722

PHOSPHATIDYL INOSITOL ANALOGS USEFUL AS ANTI-INFLAMMATORY/ANALGESIC AGENTS

Shu S. Yang, Bridgewater; Thomas R. Beattie, Scotch Plains; Philippe L. Durette, New Providence; Timothy F. Gallagher, Metuchen, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 30, 1982, Ser. No. 362,632
Int. Cl.³ C07F *9/10, 9/08, 9/113;* **A61K** *31/66*
U.S. Cl. 260—403 **3 Claims**

1. A compound of formula:

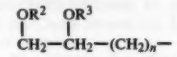


(I)

or a pharmaceutically acceptable acid, ester, ether or carbonate thereof, wherein:
L is
(a) hydrogen;
(b) R^1; where R^1 is
(1) straight or branched-chain alkyl having from 1 to 20 carbon atoms especially C_{1-6} alkyl;
(2) aryl having from 6 to 10 carbon atoms;
(3) cycloalkyl having from 3 to 8 carbon atoms;
(4) alkenyl having from 2 to 20 carbon atoms especially C_{8-20} alkenyl;
(5) cycloalkenyl having from 5 to 8 carbon atoms;
(6) aralkyl, alkaryl, aralkenyl, alkenylaryl wherein alkyl, aryl, and alkenyl are as previously defined; The above groups (1) to (6) are unsubstituted or substituted by hydroxy; alkoxy; halo; cyano; carboxy; amino; substi-

tuted amino; carbamoyl; sulfonyl; sulfinyl; thio; alkylthio; or nitro;

(c)

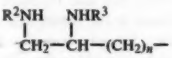


where R^2 and R^3 independently are:

(1)

n is an integer from 1 to 4; or

(d)



wherein R^2, R^3, and n are as defined previously;

R is

(a) hydrogen;

(b) loweralkyl;

(c) cycloalkyl having from 3 to 8 carbon atoms; or

(d) aralkyl; Y is oxygen or methylene; and A is a radical of

(a) myo-inositol or a configuration isomer thereof;

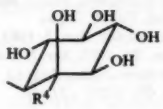
(b) branched chain myo-inositol;

(c) 2-,4 or 5-positional isomer of myo-inositol;

(d) inositol substituted with amino; azido; deoxy; halo; or

(e) branched-chain inositol of the structural formula (e);

(e)



where R^4 is C_{1-6} alkyl or substituted C_{1-6} alkyl;

(f) phosphoryl inositols having one or more of its hydroxy groups coupled with another

group; or

(g) epimeric myo-inositol.

4,515,723

QUATERNARY N-ALKYL-N,N',N'-POLYOXYALKYL-α,ω-DIAMINOALKYLENE FATTY ACID ESTERS, AND THEIR USE

Siegfried Billenstein; Herbert Hartung, both of Burgkirchen; Adolf May, Hofheim am Taunus, and Hans-Walter Bücking, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,131

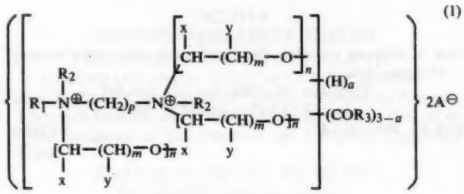
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127239

Int. Cl.³ C09F 5/00, 7/00; C11C 3/00

U.S. Cl. 260—404.5 **3 Claims**

1. Quaternary N-alkyl-N,N',N'-polyoxyalkyl-α, ω-diaminoalkylene fatty acid esters of the formula (1)

(1)



in which

R_1 is C_8–C_{30}-alkyl, or C_8–C_{30}-alkenyl,

R_2 is C_1–C_4-alkyl

R_3 is C_7–C_{29}-alkyl or C_7–C_{29}-alkenyl,

x and y each are hydrogen or methyl with the proviso that x and y are not simultaneously methyl,

a is 0, 1 or 2,

n is an integer of from 1 to 11,

m is 1 or 2,

p is an integer of from 1 to 5, and

A is an anion.

4,515,724

BORON ALKYL COMPOUNDS AND PROCESSES FOR THEIR MANUFACTURE AND USE

Wolfgang Ritter, Düsseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,518

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207264

Int. Cl.³ C09F 5/08, 7/10; C11C 3/00

U.S. Cl. 260—410 **30 Claims**

1. A boron alkyl compound comprising the addition product of an unsaturated ester, having double bonds of which about 30 to 100% are hydroborated with a boron compound;

said ester being either (a) comprised within at least one naturally occurring unsaturated fat or oil or mixture thereof having about 12 to 22 carbon atoms, or (b) at least one synthetic reaction product of a C_{12-22} hydroxy or non-hydroxy fatty acid or alcohol which has at least one olefinic double bond with a complementary polyfunctional alcohol or carboxylic acid containing from 2 to 10 carbon atoms in addition to any carboxyl radicals present; and said ester (a) or (b) having an iodine number between about 5 and 130;

said boron compound being at least one borane or organoborane having at least one alkyl, cycloalkyl or aryl radical with from 1 to 25 carbon atoms;

and wherein said boron alkyl compound has enhanced stability in the presence of air and is soluble in reaction systems containing monomers having polymerizable double bonds.

4,515,725
PROCESS FOR PREPARING BORIC ESTERS OF GLYCEROL FATTY ACID ESTERS

Tatsuro Tsuneno, Wakayama, and Masaaki Takaku, Oosaka, both of Japan, assignors to Kao Corporation, Tokyo, Japan

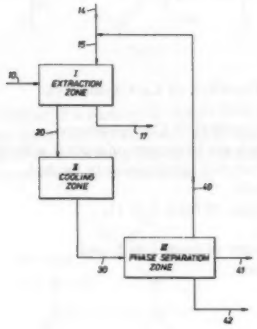
Filed Jul. 26, 1983, Ser. No. 517,439
Claims priority, application Japan, Aug. 3, 1982, 57-135374
Int. Cl.³ C11C *3/02*
U.S. Cl. 260—410.7 **3 Claims**

1. A process for preparing a boric ester of a glycerol fatty acid ester which consists essentially in reacting 3 mols of boric acid, 1 to 2 mols of at least one long-chain fatty acid triglyceride, and 4 to 5 mols of glycerol under neutral or acidic conditions at a temperature of 240° to 280° C.

4,515,726
OILSEED EXTRACTION PROCESS

Don A. Sullivan, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 28, 1984, Ser. No. 625,491
Int. Cl.³ C11B *1/00*; C07F *5/02*
U.S. Cl. 260—412.4 **7 Claims**



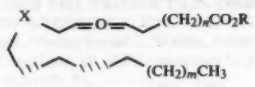
1. A process for the solvent extraction of oil and of lecithin and/or related phosphatide compounds from soybeans, comprising steps for (a) continuously contacting in an extractor the soybeans with an isopropanol-based extraction solvent containing a recycle solvent and, optionally, a make-up solvent to obtain a miscella extract and a seed meal (b) substantially draining liquid from the seed meal and withdrawing the drained seed meal from the process, (c) cooling the miscella to a temperature in the range from about 30° to 80° F., (d) phase separating the cooled miscella, (e) recovering from the phase separation an upper solvent-rich phase, an intermediate lecithin/phosphatide-rich phase, and a lower crude oil phase, and (f) directly and continuously recycling the solvent-rich phase to the extractor as the recycle solvent, with the provision that the quantity of isopropanol contained in the recycle solvent is at least about 90% of the total isopropanol in the extraction solvent.

4,515,727
ALLENE CONTAINING ARACHIDONIC ACID DERIVATIVES

John W. Patterson, Jr., Mountain View, and Jurg R. Pfister, Los Altos, both of Calif., assignors to SYNTEX (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 13, 1982, Ser. No. 434,206
Int. Cl.³ C11C *1/00*
U.S. Cl. 260—413 **13 Claims**

1. A compound of the formula



I

wherein

R is hydrogen, an alkyl group of 1 to 6 carbon atoms or a pharmaceutically acceptable salt;

X is CH=CH, CH_2S, SCH_2, or S;

n is 1 or 2 but is 1 when X is CH=CH;

m is 0–6; and the dotted lines represent a single or double bond.

4,515,728
SYNTHESIS OF HETERONUCLEAR OSMIUM CARBONYL HYDRIDES UNDER GASEOUS HYDROGEN

Sheldon G. Shore, Columbus, and Wen-Liang Hsu, Copley, both of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 322,447, Nov. 18, 1981, Pat. No. 4,389,347. This application Jun. 15, 1983, Ser. No. 504,479
Int. Cl.³ C07F *15/00*
U.S. Cl. 260—429 CY **27 Claims**

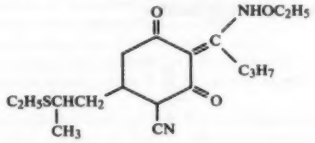
7. A process for producing $H_4(\eta^5\text{—}C_5(CH_3)_5)RhOs_3(CO)_9$ and $H_2(\eta^5\text{—}C_5(CH_3)_5))Rh_2Os_2(CO)_7$, which comprises establishing, in the presence of gaseous hydrogen, a reaction mixture comprising $Rh(\eta^5\text{—}C_5(CH_3)_5)(CO)_2$, $H_2Os_3(CO)_{10}$ and a solvent which at least partially solubilizes one of said $Rh(\eta^5\text{—}C_5(CH_3)_5)(CO)_2$ and said $H_2Os_3(CO)_{10}$, said reaction mixture being established in the substantial absence of molecular oxygen and water, thereby forming $H_4(\eta^5\text{—}C_5(CH_3)_5)$-$RhOs_3(CO)_9$ and $H_2(\eta^5\text{—}C_5(CH_3)_5)Rh_2Os_2(CO)_7$ in said reaction mixture and recovering said $H_4(\eta^5\text{—}C_5(CH_3)_5)RhOs_3$-$(CO)_9$ and $H_2(\eta^5\text{—}C_5(CH_3)_5)Rh_2Os_2(CO)_7$ from said reaction mixture.

4,515,729
CYCLOHEXANE DERIVATIVES

Isao Iwataki; Kagari Fujita; Hisao Ishikawa; Hideo Hosaka, and Kenichi Kohara, all of Kanagawa, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Continuation of Ser. No. 269,468, Jun. 2, 1981, abandoned. This application Jan. 26, 1983, Ser. No. 461,000
Claims priority, application Japan, Jun. 12, 1980, 55-78397
Int. Cl.³ C07C *121/46*
U.S. Cl. 260—464 **1 Claim**

1. A compound having the structural formula



also known as 2-(1-ethoxyaminobutylidene)-5-(2-ethylthiopropyl)-4-cyanocyclohexane-1,3-dione.

4,515,730
COMPOUNDS FOR DETERMINING THE PH VALUE IN THE INTERIOR OF A CELL

Günter Valet, Gräfelfingerstrasse 79a, D-8000 Munich; Gerhard Ruhenstroth-Bauer, Spitzelbergerstrasse 11, D-8302 Gräfelfing; Erich Wünsch, Midgardstrasse 16, D-8132 Tutzing, and Luis Moroder, Lena-Christ-Strasse 12, D-8033 Martinsried, all of Fed. Rep. of Germany

Continuation of Ser. No. 346,094, Feb. 5, 1982, abandoned. This application Jul. 2, 1982, Ser. No. 394,784

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104078

Int. Cl.³ C07C *121/75*

U.S. Cl. 260—465 D 2 Claims

1. 1,4-dibutyryloxy-2,3-dicyanobenzene.

4,515,731
ASYMMETRIC CATALYSIS

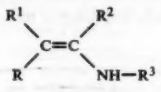
Gerald L. Bachman, Des Peres, and Billy D. Vineyard, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 274,976, Jun. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 854,447, Nov. 23, 1977, abandoned, which is a continuation of Ser. No. 607,304, Aug. 25, 1975, abandoned. This application Jul. 8, 1983, Ser. No. 512,282

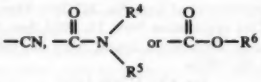
Int. Cl.³ C07C *121/78*

U.S. Cl. 260—465 D 20 Claims

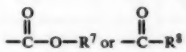
1. An asymmetric hydrogenation process comprising hydrogenating an olefinic substrate consisting essentially of the Z geometric isomer of a compound of the formula



wherein at least one of R and R^1 represents hydrogen and the other independently represents hydrogen, unsubstituted or substituted lower alkyl or aryl; R^2 represents

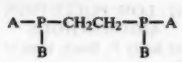


wherein R^4 and R^5 each independently represent hydrogen, unsubstituted or substituted lower alkyl or unsubstituted or substituted aryl, R^6 represents hydrogen, unsubstituted or substituted lower alkyl or unsubstituted or substituted aryl; and R^3 represents



wherein R^7 and R^8 each independently represent unsubstituted or substituted lower alkyl or unsubstituted or substituted aryl; provided that when R^3 represents

R^2 represents —CN, in the presence of a catalytic amount of a homogeneous, coodination complex of rhodium, iridium or ruthenium in combination with an optically active bis phosphine ligand represented by the formula



wherein A and B each independently represent substituted and unsubstituted alkyl of from 1 to 12 carbon atoms, substituted and unsubstituted cycloalkyl having from 4 to 7 carbon atoms, substituted and unsubstituted aryl; provided that such substituents provide no significant interference with the steric requirements around the phosphorus atom and A and B are different.

4,515,732
CONVERSION OF ACETONITRILE TO GLYCOLONITRILE AND/OR GLYCOLAMIDE

James F. Brazdil, Jr., Mayfield Village; William A. Marritt, Cleveland Heights, and Michael D. Ward, South Euclid, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 29, 1984, Ser. No. 614,609

Int. Cl.³ C07C *121/36, 103/167*

U.S. Cl. 260—465.6 3 Claims

1. The vapor oxidation of acetonitrile with molecular oxygen in the presence or absence of water vapor and in the presence of a solid heterogeneous oxidation catalyst to produce glycolonitrile or glycolamide, wherein (1) glycolamide is produced only when water is present and (2) said acetonitrile, oxygen and water are the sole reactants present.

4,515,733
METHOD FOR MAKING 1,3,5,2,4,6-TRIOXATRIPHOSPHORINANES

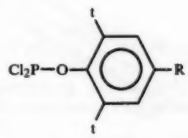
Dwight W. Chasar, Northfield, and Perry D. Matheny, Doylestown, both of Ohio, assignors to The B. F. Goodrich Co., Akron, Ohio

Filed Nov. 7, 1983, Ser. No. 548,910

Int. Cl.³ C07F *9/15*

U.S. Cl. 260—988 6 Claims

1. A method for making 2,4,6-tris(substituted phenoxy)-1,3,5,2,4,6-trioxatriphosphorinanes comprising reacting together substituted phenylphosphorodichloridites having the formula



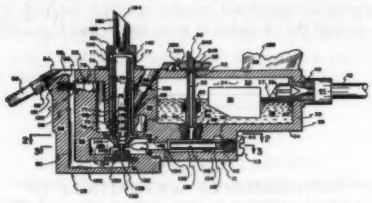
wherein t is t-butyl or t-pentyl, R is hydrogen, a primary, secondary, or tertiary alkyl radical containing 1 to 9 carbon atoms, cycloalkyl radicals containing 3 to 6 carbon atoms, a halogen radical, a cyano radical, alkoxy radicals containing 1 to 8 carbon atoms, phenyl, $—COOR_2$, $—CH_2CHO_2COOR_3$ and $—C(CH_3)_2CON(R_4)_2$ radicals wherein R_2 and R_3 are alkyl radicals containing 1 to 18 carbon atoms, and R_4 is an alkyl radical containing 1 to 9 carbon atoms, with water and a trialkylamine wherein the alkyl group contains 4 to 8 carbon atoms, in acetone.

4,515,734

FUEL EFFICIENT, LOW POLLUTION CARBURETOR AND METHODS

Howard P. Rock, and Kelly P. Rock, both of 5034 Del Rio, Salt Lake, Utah 84117

Filed Jan. 28, 1983, Ser. No. 461,847
Int. Cl.³ F02M 23/12
U.S. Cl. 261—50 R 7 Claims



1. A method of atomizing, vaporizing and homogenizing fuel within a carburetor for an internal combustion engine comprising the steps of:

selectively controlling the flow of fuel along a fuel atomizing, vaporizing and homogenizing carburetor flow path;

continuously delivering air into the flow path at a plurality of spaced sites therealong;

turbulently and vortically comingling air introduced into the flow path with the pre-existing flow at each site for atomizing and vaporizing the fuel and homogenizing the fuel-/air mixture without the specific application of heat to the mixture;

vortically causing the unvaporized fuel to impinge as a liquid upon a separating surface;

re-introducing the separated liquid fuel directly into the atomizing, vaporizing and homogenizing carburetor flow path; and

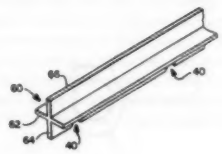
delivering a homogenous mixture of fuel vapor and air into the engine without the specific application of heat to the mixture.

4,515,735

SLOTTED SPLASH BARS FOR GAS LIQUID CONTACT APPARATUS

Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif. 94904

Continuation-in-part of Ser. No. 428,438, Sep. 29, 1982, abandoned. This application Nov. 4, 1983, Ser. No. 548,691
Int. Cl.³ B01F 3/04
U.S. Cl. 261—111 9 Claims



1. A cross-shaped splash bar for a cooling tower, said splash bar including an elongate generally flat splash plate section and at least two structural rib sections longitudinal to said splash plate section, said rib sections being integral with and projecting along the axis of said splash plate section, one of said rib sections projecting to one side of said splash plate section and the other rib section projecting to the opposite side of said splash plate section, said two rib sections being aligned with each other, said one rib section defining multiple spaced apart open slots adapted to receive a transverse horizontal string wire of a cooling tower on the lower side of said splash bar, said slots extending from the free edge of said one rib section inwardly toward said splash plate section, each of said slots being sloped at a substantial angle off perpendicular to the longitudinal direction of said one rib section, said slots serving to stabilize the splash bar against wind updrafts when said splash bars are disposed in a cooling tower.

4,515,736

METHOD FOR ENCAPSULATING MATERIALS INTO LIPOSOMES

David W. Deamer, Woodland, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed May 12, 1983, Ser. No. 493,952
Int. Cl.³ A61K 9/52; B01J 13/02
U.S. Cl. 264—4.3 13 Claims

1. A method for encapsulation materials into liposomes comprising:

providing a single phase, polar solution, the polar solution having initial liposomes dispersed therein and having a quantity of material to be encapsulated dispersed therein, the initial liposomes and the quantity of material being in a mass ratio of from about 2:1 to about 50:1 in the polar solution;

drying the initial liposomes in the presence of the quantity of material by removing substantially all of the polar solution therefrom and forming a highly viscous, concentrated admixture; and,

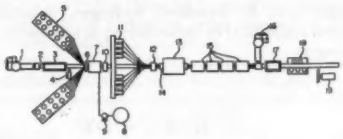
hydrating the concentrated admixture to form resultant liposomes, the resultant liposomes having a portion of the quantity of material previously dispersed in the polar solution of the providing step encapsulated therein, the portion of material encapsulated in the resultant liposomes being at least about 1 wt. % with respect to the quantity of material previously dispersed in the polar solution of the providing step.

4,515,737

PROCESS FOR PRODUCING COMPOSITE PLASTIC PIPE

Saburo Karino, Osaka, and Yoshiaki Ishida, Nara, both of Japan, assignors to Dainippin Ink and Chemicals Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 267,769, May 28, 1981, abandoned. This application Nov. 23, 1983, Ser. No. 554,816
Claims priority, application Japan, May 28, 1980, 55-70073; May 28, 1980, 55-70076
Int. Cl.³ H05B 3/00
U.S. Cl. 264—22 12 Claims



1. A process for producing a composite plastic pipe, which comprises producing a thermoplastic resin pipe (I) by an extruder, covering the surface of the pipe (I) uniformly with a continuous fibrous reinforcing material (II) impregnated with a thermosetting resin selected from the group consisting of unsaturated polyester resins and unsaturated carboxylic acid-modified vinyl ester in its axial direction by a draw molding method, helically winding a continuous fibrous reinforcing material (III) impregnated or not impregnated with the thermosetting resin uniformly on the layer of the resin fibrous reinforcing material (II) by a filament winding method, thereafter curing the thermosetting resin by irradiation of ultraviolet

light and coating a thermosplastic resin (IV) on the resulting product within a crosshead die in an extruder.

4,515,738

METHOD OF MONITORING THE PRODUCTION OF EXTRUDED PROFILES AND AN APPARATUS INCORPORATING MEANS FOR EFFECTING SUCH MONITORING

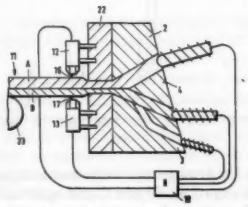
Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,708

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315184

Int. Cl.³ B29F *3/00*

U.S. Cl. 264—40.7 **8 Claims**



1. A method of monitoring the formation of composite profiles from mixtures of rubber or thermoplastics materials comprising the steps of

(a) supplying components of said mixture to an extrusion head from individual worm extruders;

(b) extruding said mixture through a nozzle outlet of an extrusion head to form a profile;

(c) permitting said profile to swell;

(d) scanning both sides and the top and bottom of said profile emerging from the extrusion head by means of spacing measurement devices located immediately downstream of the nozzle outlet of the extrusion head;

(e) comparing said measured spacing with a desired value, and

(f) modifying the worm speed of one or more of the individual extruders to cause said measured spacing to return to said desired value.

2. An extrusion apparatus for producing composite profiles having at least three parts including a base, a tread strip, and separate lateral strips at the sides of said tread strip, from mixtures of rubber or plastics materials comprising:

(a) at least three worm extruders, each said extruder conveying one component of said composite profile;

(b) a drive mechanism associated with and driving each said extruder;

(c) an extrusion head into which each said extruder conveys its component, said extrusion means comprising profile nozzle means, said composite profile being extruded from said extrusion head through said profile nozzle means;

(d) spacing measurement means disposed downstream of said nozzle means, said spacing measurement means being located at both sides and the top and bottom of said profile and being located at a pre-selected spacing from the base, tread strip and lateral strips emerging from said nozzle means;

(e) support means located downstream of said spacing measurement means for supporting the extruded composite profile, and

(f) a regulating means connected to each said drive mechanism for each said individual extruder, said regulating means acting on each of said drive mechanisms to modify the flow rate from said individual extruders in response to signals transmitted from said spacing measurement means to said regulating means.

4,515,739

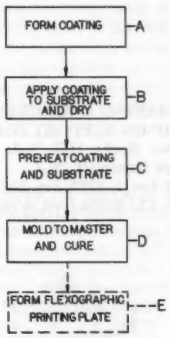
MATRIX COATING SYSTEM AND METHOD OF MANUFACTURE THEREOF

Richard L. Maine, Willimantic, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Oct. 27, 1983, Ser. No. 546,208

Int. Cl.³ B32B *5/18, 5/20;* **B41B** *5/02;* **B41D** *7/00*

U.S. Cl. 264—45.3 **36 Claims**



1. A method of making a matrix for molding printing plates including the steps of:

combining a matrix coating and at least one chemical blowing agent to form a slurry;

applying said slurry to a substrate to form a wet coating;

drying said wet coating whereby a porous partially expanded matrix coating which is moldable and curable under heating conditions is formed on said substrate.

23. A matrix for molding printing plates including:

a substrate;

a matrix dried, porous partially expanded coating applied to said substrate;

said matrix coating containing chemical blowing agents and being moldable and curable under heating conditions.

4,515,740

METHOD OF FORMING SOLID FORM FUEL ADDITIVES

Alexander D. Schuettenberg, and James T. Gragson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 197,457, Oct. 16, 1980, , Continuation-in-part of Ser. No. 112,363, Jan. 15, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 403,981

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—50 **23 Claims**

1. A method of forming solid form fuel additives comprising:

heating together a structural agent effective, upon cooling, to provide dimensional stability to the solid form fuel additive, the structural agent being soluble and dispersible in gasoline, and a normally liquid fuel additive to at least the melting point temperature of the structural agent;

allowing the thus-formed mixture of additive and structural agent to cool;

stirring the thus formed mixture of additive and structural agent;

foaming the mixture by dispersing a gaseous phase as fine bubbles in the mixture, said mixture being close to and above a solidification temperature of the mixture; and

forming the thus formed foam into solid pellets soluble and dispersible in gasoline.

4,515,741

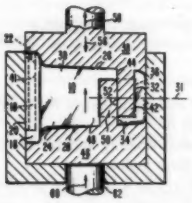
METHOD FOR MAKING AMBIDIRECTIONAL PRESSED CERAMIC SLIP-ON SUPPORT FOR A TOWEL BAR

Pekka Korpijaakko, Rocky Hill, N.J., assignor to Willette Corporation, New Brunswick, N.J.

Filed Apr. 1, 1982, Ser. No. 364,553

Int. Cl.³ B28B *1/44, 3/00, 7/16*

U.S. Cl. 264—62 **7 Claims**



1. A method for making an ambidirectional pressed ceramic slip-on support for a towel bar comprising:

(a) forming a first mold member defining a first cavity therein and including a first mold protruding means extending upwardly therefrom adjacent a side wall defining the first cavity to define a first wiping surface therealong;

(b) forming a second mold member defining a second cavity therein and including a second mold protruding means extending downwardly therefrom adjacent a side wall defining the second cavity to define a second wiping surface therealong extending parallel with respect to said first wiping surface;

(c) depositing ceramic material into the first mold member;

(d) pressing the first mold member and the second mold member together and the first cavity and the second cavity together to press the ceramic material into the desired shape within the cavities, the direction of said pressing being parallel with respect to the planes of said first and second wiping surfaces;

(e) wiping the first wiping surface against the second wiping surface during said pressing to define by the first and second mold protruding means a laterally facing external opening within the pressed ceramic material which is perpendicular to the direction of pressing movement;

(f) removing said first mold member from contact with said second mold member to facilitate removal of the pressed ceramic support; and

(g) ejecting of the pressed ceramic support from the first mold member.

4,515,742

CONTINUOUS INORGANIC FIBERS AND PROCESS FOR PRODUCTION THEREOF

Seishi Yajima, deceased, late of Higashihiroshima (by Mantaro Yajima, heir); Akiko Noda, heir, Tokyo; Kiyohito Okamura, Oharai; Yoshio Hasegawa, Oharai, and Takemi Yamaura, Oharai, all of Japan, assignors to UBE Industires, Ltd., Yamaguchi, Japan

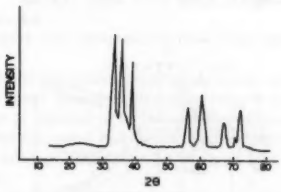
Filed Dec. 15, 1981, Ser. No. 330,999

Claims priority, application Japan, Dec. 18, 1980, 55-178112; Dec. 25, 1980, 55-182817

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.³ D01D *5/04*

U.S. Cl. 264—63 **12 Claims**



1. A process for producing continuous inorganic fibers consisting substantially of Si, Zr and C and optionally of O, which comprises a first step of preparing a semi-inorganic block copolymer comprising polycarbosilane blocks having a main chain skeleton composed mainly of carbosilane units of the formula —Si—CH_2—, each silicon atom of said carbosilane units having bonded thereto a side-chain group selected from the group consisting of hydrogen, lower alkyl and phenyl, and zirconoxane units of the formula —Zr—O—; a second step of preparing a spinning dope of said semi-inorganic block copolymer and spinning the dope; a third step of subjecting the resulting fibers to a treatment of rendering them infusible under tension or under no tension; and a fourth step of firing the infusible fibers at a temperature of 800° to 1800° C. in a vacuum or in an atmosphere of an inert gas or a reducing gas.

4,515,743

METHOD OF PRODUCING A REINFORCED TOOTHED BELT HAVING A FABRIC COVER

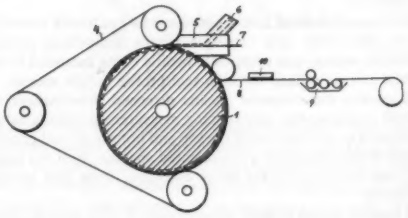
Rudolf Breher, Porta Westfalica, Fed. Rep. of Germany, assignor to BRECO Kunststoffverarbeitungs- GmbH & Co. KG, Porta Westfalica, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,637

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1982, 3200063

Int. Cl.³ B29C *5/00*; **B29H** *3/08, 3/10*

U.S. Cl. 264—135 **3 Claims**



1. A method of producing a toothed belt of extrudable material having a tension-proof reinforcing insert relative to which a strip of extensible fabric in a substantially unextended state is also introduced continuously into a mold hollow chamber beginning, such fabric strip being placed upon teeth of a mold

wheel depression so that the fabric strip in the hollow mold chamber is pressed into the mold wheel by plasticized synthetic material whereby the fabric strip is pressed into tooth grooves of the mold wheel depression, said belt having a fabric cover on the toothed side of said belt, and a reinforcing insert which extends in the longitudinal direction of said belt and which serves for tension-proof stiffening of the toothed belt synthetic material; said method in combination comprising the steps of:

providing a molding wheel which can be driven continuously and which, on its periphery, is provided with an annular depression which, in the manner of a gear wheel, includes alternating teeth and grooves, and which corresponds in cross section to the cross section of said belt which is to be produced;

providing a cover which closes said annular depression over a portion of the periphery of said molding wheel;

forming a mold cavity between said molding wheel and said cover;

continuously introducing said extrudable material, at a plasticizing temperature, into the beginning of said mold cavity;

wetting, in its substantially unextended state, the strip of extensible fabric, which however during said wetting also is resiliently extensible in its longitudinal direction, by applying thereto a liquid adhesive agent which is adapted to enter into an adhesive connection with said extrudable material and which adhesive agent hardens and stiffens the strip of fabric by being dried and which together therewith softens again at said plasticizing temperature used for said introduction of said extrudable material;

drying and thus hardening said strip of fabric with said adhesive agent applied thereto;

then after said hardening thereof placing said strip of fabric onto said teeth ahead of said introduction of said extrudable material warmed at said plasticizing temperature into said mold cavity;

thereupon making said strip of fabric, as it rests on said teeth, resiliently extensible, accompanied by heating thereof and accompanied by purposeful resoftening of said adhesive agent, by encountering warmth of plasticizing temperature of said extrudable material as it enters said mold cavity;

subsequent to said resoftening thereupon pressing said resiliently extensible strip of fabric into said grooves to form said fabric cover specifically on only the alternating teeth and grooves on the toothed side of said belt; and

finally introducing said reinforcing insert into said mold cavity between said cover and said strip of fabric.

4,515,744

VINYL CHLORIDE POLYMER LAMINATE

Richard W. Stamper, Lambertville, Mich., and Robert C. Hultz, Toledo, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Jul. 28, 1983, Ser. No. 518,247
Int. Cl.³ B29F *3/10*
U.S. Cl. 264—171 **3 Claims**

1. The method which comprises coating on a release substrate:

(A) a first layer having a thickness of from about 12 to 50 mils and of a compounded and stabilized vinyl chloride polymer plastisol composition containing antimony trioxide and being free of a curing agent and of a blowing agent and gelling said layer at a temperature of from about 170° to 250° F. and

(B) casting on the gelled layer of (A) a second layer having a thickness of from about 12 to 50 mils and of a compounded and stabilized vinyl chloride polymer plastisol composition containing titanium dioxide and being free of a curing agent and of a blowing agent and heating said layers at a temperature of from about 250° to 400° F. for from about one to five minutes to fuse said layers and to adhere said layers together to obtain a flexible vinyl chloride polymer laminate.

4,515,745

MODIFICATION OF ETHYLENE VINYL ACETATE COPOLYMER

Theodore Churma, Berwyn; Elwood D. Latimer, Jr., Naperville, and Stephen J. Vicik, Darien, all of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 18, 1983, Ser. No. 495,656
Int. Cl.³ D01F *1/02*
U.S. Cl. 264—211 **13 Claims**

1. In a process for manufacturing an extruded film having at least one layer of ethylene vinyl acetate copolymer, wherein the copolymer is melted, extruded through a die, and stretched; the improvement comprising the presence of an effective amount sufficient to lower the melt index and modify the rheology of the ethylene vinyl acetate copolymer, and insufficient to crosslink the ethylene vinyl acetate copolymer, of a crosslinking agent in the melted copolymer during extrusion of the ethylene vinyl acetate copolymer.

4,515,746

MICROCOMPOSITE OF METAL CARBIDE AND CERAMIC PARTICLES

Milivoj K. Brun, Ballston Lake; Minyoung Lee, and Lawrence E. Szala, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,783
Int. Cl.³ C04B *35/60*
U.S. Cl. 264—332 **14 Claims**

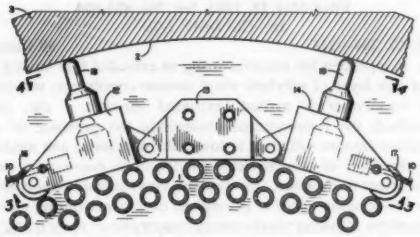
1. A process for producing a polycrystalline microcomposite consisting essentially of a continuous interconnecting phase of a carbide of a metal selected from the group consisting of hafnium, niobium, tantalum, titanium, vanadium, zirconium and mixtures thereof and a phase of ceramic particles, said phases being distributed at least significantly uniformly in said microcomposite, said microcomposite having a density greater than 95% of the theoretical density for said composite, which consists essentially of forming a particulate mixture of elemental or free carbon, a hydride of a metal selected from the group consisting of hafnium, niobium, tantalum, titanium, vanadium, zirconium and mixtures thereof, and a ceramic powder, hot pressing the particulate mixture under a pressure of at least about 200 psi at a temperature ranging from about 1200° C. to about 2000° C. decomposing said hydride of said metal producing said metal and by-product gas which vaporizes away and reacting said metal with said carbon producing the carbide of said metal as a continuous interconnecting phase, said continuous metal carbide phase encapsulating at least about 20% by volume of said ceramic particles and either encapsulating or being intermixed with the balance of said ceramic particles, said process having no significant effect on said ceramic particles, said continuous interconnecting metal carbide phase ranging from about 20% by volume to about 80% by volume of said microcomposite and the balance of said microcomposite consisting essentially of particles of said ceramic.

4,515,747

REMOTELY OPERATED MAINTENANCE AND INSPECTION EQUIPMENT TRANSPORTER

Ronald B. Creek; Charles T. Harden, both of Chattanooga, and Harold H. Harris, Harrison, all of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 27, 1982, Ser. No. 423,953
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—249 **3 Claims**



1. In a steam generator of a nuclear power installation wherein the generator is essentially a heat exchanger having a shell across the lower portion of which extends a horizontal tube sheet supporting a bundle of vertically extending tubes and surrounded by a wrapper extending downward from the upper portion of the shell to form an annulus with the inside of the shell and terminating a predetermined distance above the tube sheet, a system for cleaning and inspecting that portion of the tubes a predetermined distance above the tube sheet, including,

an opening to the annulus through the shell of the heat exchanger,

a transporter structure which can be disassembled and passed through the shell opening to a position beneath the lower end of the bundle wrapper and between the tube bundle and the internal wall of the shell where it is reassembled,

first wheel structures mounted on the transporter arranged to engage the upper surface of the tube sheet,

a cable connected to the ends of the transporter and extending around the periphery of the tube bundle and through the shell opening to a motor means operated externally to move the transporter along the periphery of the tube bundle,

inspecting and cleaning structure mounted on the transporter for removing foreign matter from the tube portions above the tube sheet and inspecting the cleaned tubes,

and extension structure mounted on the transporter and controlled in lateral movement to engage the inside of the shell wall and the tubes of the bundle for efficient operation of the inspection and cleaning structure mounted on the transporter.

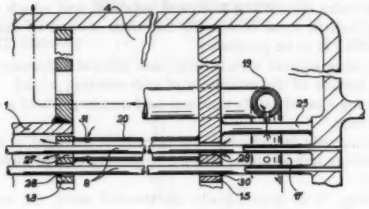
4,515,748

APPARATUS FOR DETECTION OF LOSSES IN A VAPOR GENERATOR

Jean-Pierre Fabregue, Athis-Mons, France, assignor to ELECTRICITE DE FRANCE Service National, Paris, France

Filed Jul. 8, 1982, Ser. No. 396,439
Claims priority, application France, Jul. 8, 1981, 81 13427
Int. Cl.³ G21C *17/00*; F28F *11/00*
U.S. Cl. 376—250 **7 Claims**

1. A device for the detection of leaks by sampling liquid sodium in a steam generator comprising a primary circuit constituted by an enclosure for circulating sodium between an introduction chamber and a discharge chamber, each chamber being bounded on the side of the circulation enclosure by a sodium distribution grid and on the other side by a tube plate, provided with a heat shield parallel to the tube plate and spaced therefrom by a space for the confinement of a volume of sodium for protecting the tube plate against thermal shocks, and a secondary circuit constituted by a plurality of water circulation tubes sealingly fixed at both their ends to the tube plates and issuing on the other side thereof respectively into a water supply chamber, the end portions of said tubes passing into each of the sodium introduction and discharge chambers, whilst non-sealingly traversing on the one hand the distribution chamber and on the other the heat shield corresponding



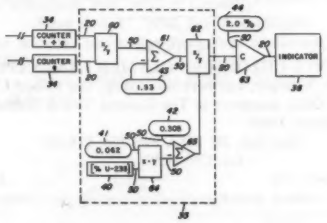
thereto, the detection device comprising means for the continuous sampling and analysis of a certain quantity of confined sodium located in the protection space, wherein the confined sodium sampling means is constituted by at least one tubular collector placed in the protection space on the periphery of the tube plate and along which are distributed a plurality of sampling openings, and a plurality of ducts issuing at one end into the protection space and at the other end into the sodium circulation enclosure, whereby in the protection space the ducts circulate the liquid sodium from the centre of said space towards its periphery.

4,515,749

SUBCRITICALITY MEASUREMENT APPARATUS AND METHOD

Frederick C. Schoenig, Jr., and James D. Landry, both of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 295,322, Aug. 24, 1981, abandoned.
This application Mar. 8, 1984, Ser. No. 587,445
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—254 **8 Claims**



1. Apparatus for providing a subcriticality value SI as a function of the moderator concentration and enrichment concentration of a mass of uranium fuel material including the isotopes U-235 and U-238, comprising: a source of epithermal neutrons positioned for directing epithermal neutrons into said mass of uranium material, said epithermal neutrons having energy in a range above the range of thermal neutrons which would cause substantial fission of said U-235 and below the range of fast neutrons which would cause fission of said U-238 whereby fission of said isotopes and the extraneous neutrons that would result from such fission are substantially avoided; a first neutron detector positioned adjacent said uranium mate-

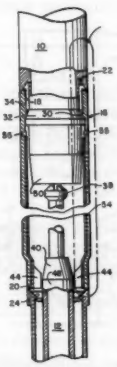
rial and responsive to substantially only epithermal neutrons for providing a first detector signal e indicative of neutrons from said source traversing said mass of uranium material without substantial moderation; a second neutron detector positioned adjacent said uranium material and responsive to both thermal and epithermal neutrons for providing a second detector signal (t+e) indicative of the sum of the neutrons from said source traversing said mass of uranium material which are moderated to thermal energy by the moderator material in said mass of uranium material and the neutrons from said source traversing said mass of uranium material without substantial moderation; divider means connected to receive said first detector signal e and second detector signal (t+e) and responsive thereto for providing an output signal proportional to ratio of said second detector signal to said first detector signal, said ratio providing an indication of the concentration of moderator material in said mass; means for subtracting a factor (1+b) from said ratio of said detector signals (where b is the ratio of thermal neutrons to epithermal neutrons at zero moderator concentration) to provide a first factor; means for multiplying a factor n (the slope of the relationship between the curve of the ratio of thermal plus epithermal neutrons to epithermal neutrons versus moderator concentration) and the enrichment concentration of said mass of uranium material (expressed as the percent of U-235) to provide a second factor; means for subtracting from said second factor a factor p (which is the derivative of the enrichment concentration of the thermal to epithermal neutron ratio with respect to moderator concentration) to provide a third factor; and means for dividing said first factor by said third factor to provide said subcriticality value SI.

4,515,750

SEALING COUPLING

John A. Pardini, Brookfield; Robert C. Brubaker, Naperville, and John J. Rusnak, Orland Park, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,070
Int. Cl.³ G21C *3/04, 3/12*
U.S. Cl. 376—446 **7 Claims**



1. A remotely operable releasable sealing coupling arrangement comprising:

a first conduit having a concave conical sealing surface, an inwardly tapered end portion, and a retaining collar disposed therebetween, said retaining collar having a camming surface;

a second conduit having a concave conical sealing surface; and

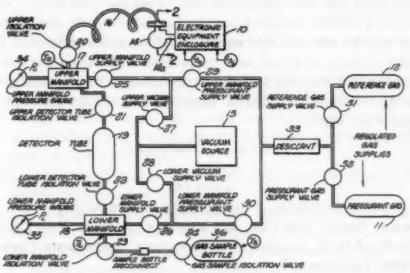
a cylindrical sleeve having a first sleeve end which includes an inside wall surface for contacting said inwardly tapered portion of said first conduit end so as to limit the lateral deflection thereof when said inwardly tapered end portion of said first conduit is inserted in said first sleeve end, said first sleeve end further including a rounded outside corner forming a convex spherical surface for sealing engagement with said concave conical surface of said first conduit, and an inwardly projecting lip on said inside wall surface of said first sleeve end, said inwardly projecting lip having a camming surface for engagement with said retaining collar of said first conduit to hold said sleeve captive on said inwardly tapered end portion of said first conduit end with an interference fit, while permitting a swiveling of said sleeve thereabout, said cylindrical sleeve further having a second sleeve end which includes a rounded outside corner forming a convex spherical surface for sealing engagement with said concave conical sealing surface of said second conduit.

4,515,751

MOISTURE CONTENT AND GAS SAMPLING DEVICE

Herman C. Krieg, Jr., Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 19, 1982, Ser. No. 350,471
Int. Cl.³ G01J *1/50*
U.S. Cl. 422—86 **11 Claims**



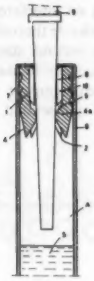
1. A test system for detecting a contaminant in a pressurant gas within the free internal space of an enclosure, said enclosure having a gas coupling and an externally operable valve for controlling gas admission and removal, comprising: a coupling device for mating to said enclosure gas coupling and having manual means for actuating said enclosure externally operable valve; a colometric detector tube comprising an elongated column of granular material subject to color change for visual qualitative and quantitative indication of said contaminant when gas containing said contaminant is passed through said detector tube; a vacuum source, a sample vessel and an interconnection system of gas-tight tubing and valves arranged to evacuate at least partially said coupling device, said detector tube, said sample vessel and said inter connection system when a predetermined setting of said valves is extant, said gas within said enclosure being at least partially withdrawn through said detector tube when a second predetermined combination of settings of said valves is extant, the amount of said contaminant drawn through said detector tube being indicated by the length of the color-changed portion of said column of material in said detector tube.

4,515,752

STOPPER FOR CONTAINERS FOR USE IN ANALYSES

Fernando X. Miramanda, Pau Casals 8-10, Caldes de Montbui (Barcelona), Spain

Filed Jun. 15, 1983, Ser. No. 504,432
Claims priority, application Spain, Jun. 18, 1982, 266.599[U]
Int. Cl.³ B65D *51/16, 39/00*
U.S. Cl. 422—99 2 Claims



1. A stopper for containers comprising: an integral single-piece body formed of a resilient material having a tubularly-shaped main portion and an inverted conically-shaped transverse end wall thereby defining an inner surface and an interiorly located cavity, said cavity containing a plurality of longitudinal ribs which extend radially inwardly from the inner surface of said tubularly-shaped main portion, the transverse wall being provided with at least one slit which defines segments of the transverse wall that abut one another to form a fluid tight seal, the transverse wall being perforatable by insertion of a tubular member into said interior cavity and through said at least one slit, the segments of the transverse wall resiliently closing to reseal said transverse wall when the tubular member is removed, and the longitudinal ribs providing vent passages when the tubular member is inserted through the transverse wall.

4,515,753

INTEGRAL REAGENT DISPENSER

John L. Smith, New City, and Vito F. Christiano, Port Chester, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,880
Int. Cl.³ G01N *1/00, 35/08*
U.S. Cl. 422—102 38 Claims

1. A unitary integral reagent container comprising:

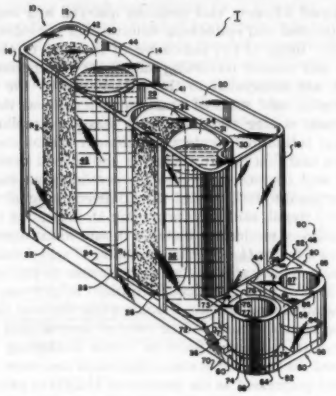
(a) means defining a plurality of reagent wells, each having a first opening for withdrawal of liquid reagent from said well therethrough and a second opening for introduction of liquid reagent into said well;

(b) means for establishing a standing level of reagent in each of said reagent wells;

(c) means comprising a reagent well interior cross-sectional area for maintaining a lens of immiscible liquid on the surface of said reagent and within a defined area of said surface when said reagent is contained in said reagent wells;

(d) means defining a plurality of reagent reservoirs for containing a supply of liquid reagent in each, said reservoir defining means being integral with said reagent well defining means, wherein each such reagent reservoir cooperates with a selected reagent well;

(e) means for repeatedly releasing a controlled amount of reagent liquid from each of said reagent reservoirs through an opening between each such reagent reservoir and the reagent well with which it cooperates and for introducing the controlled amount of reagent so-released



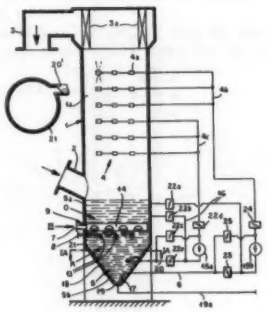
into said cooperating reagent well through said second opening thereof.

4,515,754

WASHING TOWER FOR THE DESULFURIZATION OF FLUE GASES

Werner Stehning, Dorsten, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrückkühlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 515,919
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227187
Int. Cl.³ C01B *17/05;* B01D *47/00, 53/34*
U.S. Cl. 422—168 6 Claims



1. An apparatus for the desulfurization of a flue gas comprising:

a scrubbing column defining an upper portion provided as a washing zone and a downwardly tapering conical lower portion defining an upright sump which has an apex at its bottom, means for admitting flue gas to said upper portion, means for discharging flue gas from said upper portion, and means for contacting flue gas in said washing zone with a calcium-containing scrubbing liquid, wherein the scrubbing liquid collects in said sump;

means at an upper portion of said sump for introducing oxygen into said sump so as to define an oxidation zone, for oxidizing the SO_2 into SO_3, above said means for

introducing oxygen and a reaction zone for forming calcium sulfate below said means for introducing oxygen

backwashing means including an intake conduit communicating with said sump at said oxidation zone, a pump connected to said intake conduit, a discharge conduit connected to said pump and also connected to both said apex of said sump below said intake conduit for recirculating scrubbing liquid so as to loosen deposited solids within said sump, and to a recirculation conduit which opens tangentially into said sump at said downwardly tapering lower portion.

4,515,755
APPARATUS FOR PRODUCING A SILICON SINGLE CRYSTAL FROM A SILICON MELT

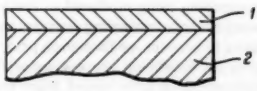
Shuitsu Matsuo, Atsugi; Yasuhiro Imanishi, Tokyo; Hideo Nagashima, Ebina; Masaharu Watanabe, Yokohama; Toshiro Usami, Yokohama, and Hisashi Murnoka, Yokohama, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Apr. 14, 1982, Ser. No. 368,440

Claims priority, application Japan, May 11, 1981, 56-70474; May 11, 1981, 56-70475; May 11, 1981, 56-70476; May 11, 1981, 56-70477; May 11, 1981, 56-70478; May 11, 1981, 56-70479

Int. Cl.³ C30B *15/34*

U.S. Cl. 422—246 **11 Claims**



1. In an apparatus for production silicon single crystal by seed pulling from a melt contained in a crucible for molten silicon, the improvement which comprises on at least a portion of the surfaces of said crucible which comes in contact with said silicon melt include a layer comprised of silicon nitride precipitated from a gaseous phase and containing at least 20% of β phase.

4,515,756
PROCESS FOR EXTRACTING TUNGSTEN OR MOLYBDENUM FROM SOLUTION

David J. Blumer, Huntington Beach, Calif., assignor to Occidental Research Corporation, Los Angeles, Calif.

Filed Dec. 9, 1980, Ser. No. 214,810

Int. Cl.³ C01G *39/00, 41/00*

U.S. Cl. 423—54 **20 Claims**

1. A process for the recovery of molybdenum and/or tungsten from a solution which comprises the steps of:

(a) passing said solution through a packed column containing an adsorbent,

(b) adsorbing tungsten and/or molybdenum on said adsorbent,

(c) passing a solution depleted in tungsten and/or molybdenum from said column,

(d) passing a stripping solution through said column containing tungsten and/or molybdenum on said adsorbent to remove tungsten and/or molybdenum with said stripping solution,

(e) repeating steps (a) through (d) until the stripping solution contains at least about 1 gram per liter of tungsten and/or molybdenum,

(f) passing said solution containing at least about 1 gram of tungsten and/or molybdenum per liter into a recovery zone,

(g) adjusting the pH of said stripping solution containing at least about 1 gram per liter of tungsten and/or molybdenum to approximately 13.0 by addition of a strong acid and thereby raising the temperature of said solution at least about 10° C.,

(h) adding a calcium ion-containing solution to said pH adjusted solution to precipitate calcium tungstate and/or calcium molybdate, and

(i) recovering said precipitate of tungsten and/or molybdenum as calcium tungstate and/or calcium molybdate.

4,515,757
STRIPPING A SOLUTION CONTAINING MOLYBDENUM, TUNGSTEN AND/OR VANADIUM VALUES

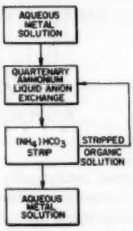
Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 422,814, Sep. 24, 1982, Pat. No. 4,434,140. This application Feb. 22, 1984, Ser. No. 582,365

The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.

Int. Cl.³ C01G *39/00, 31/00, 41/00*

U.S. Cl. 423—54 **10 Claims**



1. A method of stripping an organic extraction solvent containing

(a) a metal quaternary alkyl ammonium complex selected from the group consisting of molybdenum, vanadium and tungsten quaternary alkyl ammonium complex or mixture of molybdenum, vanadium and tungsten quaternary alkyl ammonium complexes

(b) a mixture of molybdenum and tungsten quaternary alkyl ammonium complexes,

(c) a mixture of vanadium and tungsten quaternary alkyl ammonium complexes comprising:

contacting said organic extraction solvent with an aqueous stripping solution maintained at a temperature of no more than 50° C., a pH between 7 and 9, and containing at least 75 grams per liter of a salt of a bicarbonate ion, for a time sufficient to convert said metal quaternary alkyl ammonium complex or mixtures thereof to an aqueous soluble metal complex; and

separating said organic extraction solvent and said aqueous stripping solution.

4,515,758
PROCESS AND CATALYST FOR THE REDUCTION OF THE IGNITION TEMPERATURE OF DIESEL SOOT FILTERED OUT OF THE EXHAUST GAS OF DIESEL ENGINES

Rainer Domesle, Maintal; Edgar Koberstein, Alzenau; Hans-Dieter Pietka, Freigericht, and Herbert Voelker, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 521,292

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232729

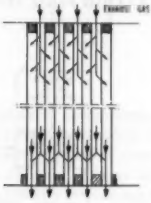
Int. Cl.³ B01D *53/36*

U.S. Cl. 423—213.2 **7 Claims**

1. A process for the reduction of ignition temperature of

Diesel soot filtered out of the exhaust gas of Diesel engines comprising passing the exhaust stream produced by a Diesel engine over a catalytically active substance consisting of an alkali metal perrhenate or silver perrhenate or an admixture of an alkali metal perrhenate or silver perrhenate with one or more of lithium oxide, copper (I)-chloride, vanadium pentoxide with 1–30% by weight of an alkali metal oxide and a vanadate of lithium, sodium, potassium or cerium.

7. A process for the reduction of ignition temperature of Diesel soot filtered out of the exhaust gas of Diesel engines comprising passing the exhaust stream produced by a Diesel engine over a first and a second catalytically active substance, the first active substances being selected from the group consisting of lithium oxide, copper (I)-chloride, vanadium pentoxide with 1–30% by weight of an alkali metal oxide, a vanadate of lithium, sodium, potassium or cerium or admixtures thereof and the second active substance being noble metal, whereby



both first and second catalytically active substances or their combinations with a carrier material are deposited on different areas of a temperature stable filter element serving as structural reinforcer, disposing said filter element in the flow cross section of the exhaust gas stream, said filter element being a monolithic ceramic body having two oppositely disposed end surfaces and numerous flow channels passing through it and having macroporous walls, the openings of the channels being provided at the opposite front surfaces with closing means in such a way that a channel is open on one end surface thereof and is closed on the opposite end surface thereof, the first catalytically active substance being applied in the area of the inlet side of the filter and the second catalytically active substance being applied in the area of the outlet side of the filter, both said active substances thus covering opposite sides of the area of each macroporous flow channel wall of the monolithic ceramic body.

4,515,759

PROCESS OF REMOVING HYDROGEN SULFIDE FROM GAS MIXTURES

Edward E. Burnes, Arroyo Grande, Calif., and Kishan Bhatia, Katy, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 549,274

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—220 **9 Claims**

1. A process for removing hydrogen sulfide from a gas mixture comprising treating said gas mixture with an aqueous medium containing an effective amount of a inorganic water soluble metal nitrite at a pH of about 5.5 or greater.

4,515,760

NON-PRECIPITATING REGULATION OF AMMONIA CONTENT IN SOUR GAS SOLVENT SCRUBBING SYSTEMS

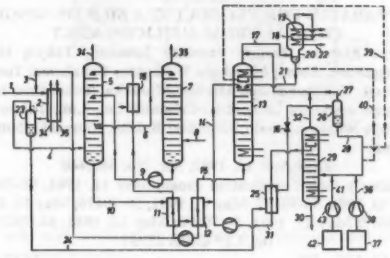
Roland Lang, Wolfratshausen, and Heinz Karwat, Pullach, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,839

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247876

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—220 **12 Claims**



1. In a method for regulating the NH_3 content in methanol in a process comprising using methanol to scrub out at least CO_2 from a gaseous mixture containing sour gas and a trace amount of NH_3 and/or to prevent ice formation prior to the scrubbing step, and after the scrubbing process, separating the absorbed gaseous components and/or water from the methanol and reusing the resultant regenerated methanol in the cycle as scrubbing liquid and/or for preventing ice formation, the improvement in the method of regulating the NH_3 content, which comprises adding a sufficient amount of a strong acid to the methanol in order to form a water-soluble ammonium salt without precipitating any ammonium salt, transferring said water-soluble salt to an aqueous phase, and removing said aqueous phase from the scrubbing cycle.

4,515,761

PROTECTIVE GARMENT OR COVER, COMPOSITE SEMIPERMEABLE BARRIER FABRIC, AND USE IN DETOXIFICATION

Irene G. Plotzker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 7, 1981, Ser. No. 281,197

Int. Cl.³ A61L *9/00;* **B32B** *27/28;* **C01B** *7/00*

U.S. Cl. 423—240 **20 Claims**

1. A protective garment fabricated at least in part from a composite fabric, said fabric containing as the essential component thereof a continuous film of a highly fluorinated ion exchange polymer having sulfonic acid metal ion salt functional groups, said metal ion having a valence of 2, +3 or +4, there being at least one fluorine atom attached to each carbon atom to which each said functional group is attached, said polymer having an equivalent weight no greater than about 2000.

14. A process wherein (a) water permeates from a first space adjacent a first side of a barrier to a second space adjacent the second side of said barrier, said barrier having as the essential component thereof a continuous film of a highly fluorinted ion exchange polymer having sulfonic acid metal ion salt functional groups, said metal ion havinga valence of +2, +3 or +4, there being at least one fluorine atom attached to each carbon atom to which each said sulfonic acid group is attached, said polymer having an equivalent weight no greater than about 2000, and (b) a hazardous substance, said substance being a toxic organophosphorus compound having a

:oiety wherein R is a C_1 to C_{10} alkyl group, or a blistering agent which contains two or more chloroethyl groups, present in said second space (i) permeates only slowly into said barrier and (ii) that portion of said hazardous substance which permeates into said barrier is detoxified at least in part by said polymer, whereby the rate of penetration of said hazardous substance into said first space is substantially decreased.

4,515,762

PROCESS FOR PROCESSING WASTE GASES RESULTING DURING THE PRODUCTION OF SILICON

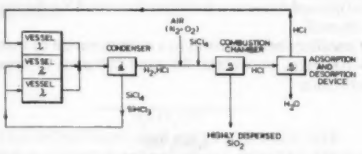
Rudolf Griesshammer, Burghausen; Franz Köppl, Altötting, both of Fed. Rep. of Germany; Winfried Lang, Ach, Austria; Ernst Mühlhofer, Sulzberg/Allgäu, and Michael Schwab, Neuötting, both of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft Für Elektronik-Grundstoffe mbH, Burgenhausen, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,145

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203743

Int. Cl.³ C01B *33/113;* C01G *17/02, 23/07*

U.S. Cl. 423—337 **4 Claims**



1. A process for processing waste gases comprising a gas mixture including chlorosilanes, hydrogen and hydrogen chloride, comprising the steps of:

(a) removing the chlorosilanes contained in the waste gas mixture by condensation;

(b) adding to the remaining gas mixture an oxygen-containing gas;

(c) adding at least one chloride selected from the group consisting of germanium chloride, titanium chloride and silicon tetrachloride to the gas mixture resulting from step (b) and subjecting the same to combustion for the pyrogenic formation of oxide particles; and

(d) recovering the hydrogen chloride remaining in the gas mixture following step (c) for reuse.

4,515,763

HIGH SPECIFIC SURFACE AREA CARBIDES AND NITRIDES

Michel Boudart, Stanford; Shigeo T. Oyama, Palo Alto, and Leo Volpe, Redwood City, all of Calif., assignors to Board of Trustees of Leland Stanford Jr. Univeristy, Stanford, Calif.

Continuation of Ser. No. 283,587, Jul. 15, 1981, abandoned. This application Dec. 14, 1982, Ser. No. 449,809

Int. Cl.³ C01B *21/26, 31/34*

U.S. Cl. 423—409 **12 Claims**

1. A method for preparing high specific surface area molybdenum and vanadium carbides and nitrides from an oxide, said carbides and nitrides having at least a 5-fold increase in surface area over said oxide,

which method comprises:

in a first heating, heating said oxide to a temperature prior to significant reduction and formation of said carbide or nitride;

in a second heating following said first heating, continuing heating of said oxide substantially uniformly and continuously at a rate in the range of about 0.1° to 5° K./min in the presence of a reducing environment and a source of carbon or nitrogen from a time at least 20 minutes prior to the time of completion of formation of said carbide or nitride and at a temperature at least 25° K. prior to substantial completion of formation of said carbide or nitride, and through a temperature range where reduction of said oxide and reaction with carbide and nitrogen occurs to form a carbide or nitride respectively, said heating continuing until said reaction is substantially complete as evidenced by the substantial absence of change in the effluent composition; and

quenching the reaction by lowering the temperature within the lesser of about one hour or about 50 percent of the time of said second heating.

4,515,764

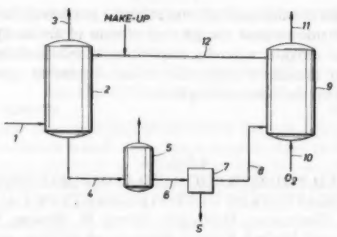
REMOVAL OF H_2S FROM GASEOUS STREAMS

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1983, Ser. No. 563,477

Int. Cl.³ B01D *53/34;* C01B *17/05*

U.S. Cl. 423—573 R **15 Claims**



1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) vigorously contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution comprising an effective amount of an oxidizing polyvalent metal chelate of nitrilotriacetic acid, or mixture of such chelates, and an amount of phosphate and thiosulfate ions effective to improve sulfur quality, said phosphate and thiosulfate ions being present in a molar ratio of from about 0.5 to 3:1, and producing a sweet gas stream and an aqueous solution containing crystalline sulfur and the reduced polyalent metal chelate or chelates of said acid;

(b) removing crystalline sulfur from the aqueous solution;

(c) regenerating the aqueous solution in a regenerating zone and producing a regenerated reactant in said solution; and

(d) returning regenerated solution from step (c) to the contacting zone.

4,515,765

METHOD FOR THE PRODUCTION OF ANTIMONY OXIDE

Robert J. Zellner, Shaker Heights, Ohio, assignor to McGean-Rohco, Inc., Cleveland, Ohio

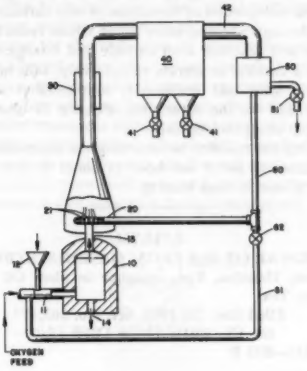
Filed Dec. 23, 1983, Ser. No. 564,926

Int. Cl.³ C01B *27/00*

U.S. Cl. 423—617 **6 Claims**

1. A process for the production of antimony oxide from antimony sulfide which comprises the steps of comminuting the antimony sulfide to form a plurality of antimony sulfide containing particles, mixing the antimony sulfide containing particles with substantially pure oxygen, reacting the antimony

sulfide with said oxygen to form a gaseous stream of antimony oxide and sulfur dioxide, cooling the gaseous stream below the boiling point of antimony oxide, separating the condensed antimony oxide from sulfur dioxide, further cooling the separated sulfur dioxide and utilizing at least a portion of the cooled sulfur dioxide to cool the gaseous stream of antimony oxide and sulfur dioxide, whereby disposition of substantially all of the sulfur dioxide is controlled so as to prevent substantial venting into the open atmosphere.



4,515,766

LABELED PHOSPHONIC ACID COMPOSITIONS FOR INVESTIGATIONS OF IN VIVO DEPOSITS OF CALCIUM

Frank P. Castronovo, Burlington; Harry W. Strauss, Newton Center, and Majic S. Potsaid, Hanover, all of Mass., assignors to The Massachusetts General Hospital, Mass.

Continuation-in-part of Ser. No. 162,370, Jun. 23, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,540

Int. Cl.³ A61K *43/00, 49/00;* **C07F** *9/02*

U.S. Cl. 424—1.1 **16 Claims**

1. A composition of matter comprising a radiolabeled, with a radioisotope, diphosphonic acid, said diphosphonic acid represented by the formula:

wherein: R_1 is aryl and is labeled with a halogen and R_2 is hydrogen, alkyl, alkenyl, amine, benzyl, hydroxyl, —CH_2PO_3H —$CH_2CH_2PO_3H_2$ and is labeled with halogen, said radiolabel selected from the group consisting of a radioactive halogen and both a radioactive halogen and a technetium-99m.

4,515,767

RADIOACTIVE METALS COMPLEXED WITH PHOSPHONATE DERIVATIVES OF DICYCLOPENTADIENEBIS(METHYLAMINE)

Jaime Simón, Angleton; David A. Wilson, Richwood, both of Tex., and Wynn A. Volkert, Columbia, Mo., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 20, 1983, Ser. No. 505,665

Int. Cl.³ A61K *49/00, 43/00*

U.S. Cl. 424—1.1 **20 Claims**

1. A bone seeking complex of a radioactive nuclide and a compound having the structural formula

wherein substituents A, B, X and Y are each independently selected from radicals including hydrogen, hydroxyalkyl (wherein the alkyl group contains 2–6 carbon atoms) methylenephosphonic, methylene-, ethylene- and propylene-sulfonic, carboxylic acid radicals (having 2–4 carbon atoms) and the alkali or alkaline earth metal, ammonia and amine salts, thereof and wherein at least one A, B, X and Y is methylenephosphonic acid or a salt thereof.

4,515,768

INSECTICIDAL VAPORS-EMITTING COMPOSITION ON A PYRETHRINOID BASE

Claude Hennart, Seraincourt, and René Blanc, Ligugé, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Continuation of Ser. No. 239,713, Mar. 2, 1981, abandoned. This application Dec. 3, 1982, Ser. No. 446,539

Claims priority, application Luxemburg, Mar. 5, 1980 82225

Int. Cl.³ A01N *25/18*

U.S. Cl. 424—40 **6 Claims**

1. A composition which emits insecticidal vapors upon being heated comprising at least 5%, by weight, of an insecticidal substance of the family of pyrethrinoids susceptible to thermal decomposition and O,O-diethyl (3,5-ditert-butyl-4-hydroxybenzyl)phosphonate as a stabilizer for retarding the decomposition thereof;

said stabilizer being present in a concentration of from about 5–100 parts, by weight, for each 100 parts of insecticidal substance.

4,515,769

ENCAPSULATED FLAVORANT MATERIAL, METHOD FOR ITS PREPARATION, AND FOOD AND OTHER COMPOSITIONS INCORPORATING SAME

Carleton G. Merritt, Syracuse; Winston H. Wingerd, Camillus, and David J. Keller, Weedsport, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 326,188, Dec. 1, 1981, Pat. No. 4,386,104. This application Feb. 2, 1983, Ser. No. 463,336

The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.³ A23L *1/221;* **A61K** *7/16;* **A24C** *5/47*

U.S. Cl. 424—49 **57 Claims**

1. A method for preparing a solid encapsulated flavorant material for use in compositions intended to be placed in the mouth, the method comprising steps of:

(a) preparing an aqueous emulsion of a flavorant ingredient, which flavorant ingredient comprises water distillable components, in an at least partially hydrophilic gelatin-based encapsulation material selected from the group consisting of a mixture of gelatin, a natural gum and a plasticizer, and a mixture of gelatin, an albumin and a plasticizer;

(b) drying said emulsion to produce a uniform solid matrix product having the flavorant ingredient containing substantially all of its water distillable components within a solid emulsion matrix of said encapsulation material;

(c) milling said dried solid matrix to a particle size of less than 20 mesh to produce solid powder; and

(d) coating said solid powder with a water insoluble material selected from the group consisting of polyvinyl acetate, shellac, polyvinyl alcohol, zein, high Bloom gelatin having a Bloom of over 100 to 300 and ethylcellulose to produce an encapsulated flavorant material having a relatively thin water insoluble coating which delays release of said flavorant ingredient within the mouth for a controlled period of time and yet which will thereafter release sub-

stantially all of said flavorant ingredient's original flavor notes at desired flavor levels and over a sustained period of time without having significant amounts of said flavorant ingredient dissolved in the water insoluble coating material.

4,515,770

FOOD MATERIALS FOR PREVENTION OF CARIOUS DEGRADATION OF TEETH

Frank C. Besic, Manitowoc, Wis., assignor to University Patents, Inc., Norwalk, Conn.

Division of Ser. No. 139,199, Apr. 11, 1980, Pat. No. 4,405,600, which is a continuation-in-part of Ser. No. 46,314, Jun. 7, 1979, abandoned. This application Sep. 19, 1983, Ser. No. 533,750
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.³ A23L *1/30*; A61K *7/16*; C13F *3/00*
U.S. Cl. 424—49 **4 Claims**

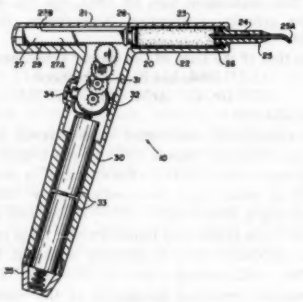
1. Sucrose in crystalline form having a soluble source of calcium ions uniformly distributed therethrough as a result of dissolution of the sucrose and soluble source of calcium ions in water and the subsequent evaporation of the water solvent, said calcium ion source being present in a quantitative weight ratio such that upon dissolution of one gram of sucrose there is also dissolved a sufficient quantity of said soluble source of calcium ions to supply to the resulting solution at least 3.25 mg of calcium ions.

4,515,771

COMPOSITION AND METHOD FOR THE PREVENTATIVE TREATMENT OF DENTAL DISEASE AND APPARATUS FOR DISPENSING SAID COMPOSITION

Daniel H. Fine, 41 Brook Ter., Leonia, N.J. 07605

Filed Apr. 11, 1983, Ser. No. 483,660
Int. Cl.³ A61K *7/18*
U.S. Cl. 424—52 **14 Claims**



1. An oral composition for the preventative treatment of dental disease, said composition including:

ascorbic acid in an amount between about 5% and about 30% by weight and pyridoxine hydrochloride in an amount up to about 3% by weight as active ingredients, both calculated based on the weight of the total composition;

a gelling agent in an amount between about 1% and about 20% by weight based on the weight of the total composition; and a vehicle.

4,515,772

ORAL COMPOSITIONS

John J. Parran, Jr., Cincinnati, and Nabil Y. Sakkab, Loveland, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 391,040, Jun. 22, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 591,228
Int. Cl.³ A61K *7/16*
U.S. Cl. 424—57 **8 Claims**

1. An oral composition in the form of a toothpaste comprising:

(a) from about 10% to about 70%, of a dental abrasive selected from the group consisting of insoluble metaphosphates, alumina, thermosetting polymerized resins and silica;

(b) an amount of a fluoride ion source sufficient to supply from about 50 ppm to about 3500 ppm of fluoride ions;

(c) an amount of a pyrophosphate salt selected from the group consisting of dialkali metal and mixtures of dialkali metal and tetraalkali metal pyrophosphate salts sufficient to provide at least 1.5% $P_2O_7^{-4}$.

(d) the remainder water; wherein the pH of said composition is from about 6.0 to about 10.0 and the composition does not contain more than about 4.0% $K_4P_2O_7$.

4,515,773

SKIN TANNING COMPOSITION AND METHOD

Walter C. Herlihy, Cambridge, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Filed Jul. 5, 1983, Ser. No. 510,777
Int. Cl.³ A61K *7/42, 7/44, 7/021*
U.S. Cl. 424—59 **6 Claims**

1. A skin tanning composition which imparts color to the human epidermis which comprises a cosmetic base in the form of a lotion, a cream or an ointment, an effective amount of a dye precursor selected from the group consisting of tyrosine, 3,4-dihydroxy phenylalanine (dopa), D-dopa, catechol, 5-hydroxyindole, tyramine, dopamine, m-aminophenol, o-aminophenol, p-aminophenol, 4-aminocatechol, 2-hydroxy-1,4-naphthaquinone (henna), 4-methyl catechol, 3-methyl catechol, 3-isopropyl 6-methyl catechol, 3,4-dihydroxybenzylamine, 3,4-dihydroxybenzoic acid, 1,2-dihydroxynaphthalene, gallic acid, resorcinol, 2-chloroaniline, p-chloroanisole, 2-amino-p-cresol, 4,5-dihydroxynaphthalene 2,7-disulfonic acid, o-cresol, m-cresol, p-cresol, or other related melanin precursors or analogs which are capable of being oxidized to tan, brown, or black compounds capable of dyeing the skin distributed through said base, and an effective amount of tyrosinase.

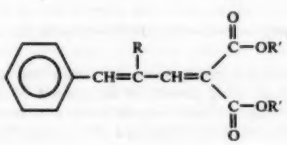
4,515,774

LIQUID, CINNAMAL DIALKYL MALONATES AS SOLE ORGANIC SUNSCREENS

Donald E. Conner, Clifton, and Kenneth Klein, Fairlawn, both of N.J., assignors to Van Dyk & Company Inc., Belleville, N.J.

Filed Jun. 18, 1984, Ser. No. 621,454
Int. Cl.³ A61K *7/42*
U.S. Cl. 424—59 **6 Claims**

1. A sunscreening composition adapted for application to the human skin comprising a non-polar cosmetic oil carrier, containing distributed therein an effective amount to provide substantial protection against erythemal and tanning radiation of between 290 and 400 nanometers of a liquid, cinnamal dialkyl malonate corresponding to the formula,



wherein R is selected from the group consisting of hydrogen, and an alkyl radical having from 1 to 8 carbon atoms, and R^1 is an alkyl radical having from 1 to 2 carbon atoms, as the sole sunscreen.

4,515,775

POLYHYDROXYL NON-IONIC SURFACTANT, PROCESS FOR PREPARING THE SAME AND COSMETIC COMPOSITION CONTAINING THE SAME

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 796,232, May 12, 1977, abandoned, which is a division of Ser. No. 629,904, Nov. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 307,524, Nov. 17, 1972, abandoned. This application Aug. 21, 1979, Ser. No. 68,390

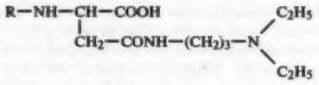
Claims priority, application Luxembourg, Nov. 18, 1971, 64289

Int. Cl.³ A61K *7/06*

U.S. Cl. 424—70 6 Claims

1. A shampoo composition comprising an aqueous carrier and a water-soluble polyhydroxyl non-ionic surfactant prepared by condensing at a temperature of 50°–120° C. glycidol and a hydroxy fatty chain reactant in a condensation reaction mixture consisting essentially of an acid catalyst selected from the group consisting of boron trifluoride and tin tetrachloride, glycidol and a hydroxy fatty chain reactant having the formula $R—CH_2—CHOH—CH_2OH$ wherein R is a 55:45 mixture of C_9H_{19} and $C_{11}H_{23}$, the molar ratio of glycidol to said hydroxy fatty chain reactant being 2.7:1, said surfactant being present in an amount of about 5–60 percent by weight of said composition and said composition having a pH ranging from about 3 to 9.5.

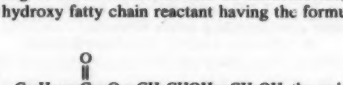
2. The shampoo composition of claim 1 which also includes a compound of the formula



wherein R is alkyl derived from copra fatty acids.

3. A foam bath composition comprising an aqueous carrier and a water-soluble polyhydroxyl non-ionic surfactant prepared by condensing at a temperature of 50°–120° C. glycidol and a hydroxy fatty chain reactant in a condensation reaction mixture consisting essentially of an acid catalyst selected from the group consisting of boron trifluoride and tin tetrachloride, glycidol and a hydroxy fatty chain reactant having the formula $R—CH_2—CHOH—CH_2OH$ wherein R is a 55:45 mixture of C_9H_{19} and $C_{11}H_{23}$, the molar ratio of glycidol to said hydroxy fatty chain reactant being 2.7:1, said surfactant being present in an amount of about 5–80 percent by weight of said composition and said composition having a pH from about 5.5 to 8.

5. A beauty milk composition consisting of an oil-in-water emulsion comprising an oil phase, a water phase and water-soluble polyhydroxyl non-ionic surfactant prepared by condensing at a temperature of 50°–120° C. glycidol and a hydroxy fatty chain reactant in a condensation reaction mixture consisting essentially of an acid catalyst selected from the group consisting of boron trifluoride and tin tetrachloride, glycidol and a hydroxy fatty chain reactant having the formula



ratio of glycidol to said hydroxy fatty chain reactant being 5:1, said surfactant being present in an amount of about 0.1–80 percent by weight of said composition so as to form said emulsion and said composition having a pH ranging from about 3 to 10.5.

4,515,776

METHOD OF PREPARING GAMMA GLOBULIN SUITABLE FOR INTRAVENOUS ADMINISTRATION

Nobuhiro Taniguchi, and Tomohiro Endo, both of Tokyo, Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,324

Claims priority, application Japan, Apr. 16, 1982, 57-62366

Int. Cl.³ A61K *39/395, 35/16*

U.S. Cl. 424—85 9 Claims

1. A method of preparing gamma globulin suitable for intravenous administration, which comprises the steps of:

dissolving (a) a gamma globulin composition selected from the group consisting of Cohn Fraction II and Cohn Fraction III, said composition containing aggregates of gamma globulin, in (b) a buffer solution having a pH in the range of 4.0 to 8.0, to obtain a solution;

adding to said solution (1) at least 0.1 to 15% of polypropylene glycol having a molecular weight in the range of 2000 to 10,000 and (2) a dispersing agent in an amount effective to disperse said polypropylene glycol in said solution, said dispersing agent being selected from the group consisting of monosaccharides, amino acids, inorganic salts, and mixtures thereof, thereby to obtain a dispersion liquid;

and filtering said dispersion liquid to obtain a filtrate containing said gamma globulin suitable for intravenous administration.

4,515,777

VACCINES

Peter Apontoweil, Leersum, and Manfred M. Krasselt, De Bilt, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Continuation of Ser. No. 103,583, Dec. 14, 1979, abandoned. This application Nov. 10, 1982, Ser. No. 440,640

Claims priority, application Netherlands, Dec. 20, 1978, 78-12359

The portion of the term of this patent subsequent to Jan. 18, 2004, has been disclaimed.

Int. Cl.³ A61K *39/17, 39/295*

U.S. Cl. 424—89 5 Claims

1. In a combined inactivated vaccine ready for use against symptoms in poultry caused by avian reo viruses and by Newcastle disease virus (NDV), characterized in that the vaccine contains an inactivated Newcastle disease virus containing liquid having a titre of $10^{9.8}$ –$10^{10.5}$ EID_{50} /ml, and an inactivated reo virus containing liquid derived from reo virus strain LZ 671 deposited with Collection d'Institut Pasteur, Paris under No. 1.092 having a titre of $10^{5.5}$ –$10^{7.5}$ EID_{50}/ml, the improvement consisting essentially of the volume ratio between the Newcastle disease virus containing liquid and the reo virus containing liquid being from 3:4 to 5:1, and wherein an oil phase with essential components selected from the group consisting of at least light paraffinic mineral oils (FDA quality), plant oils and naphthenic mineral oils and at least one emulsifier in the form of non-ionic surface-active compounds derived from esters or esterethers of alkylene oxide and/or hexahydric alcohols and/or higher natural fatty acids of 10 to 20 carbon atoms, the volume ratio between the aqueous phase formed by both virus liquids and the oil phase being from 7:13 to 3:7.

4,515,778

PREPARATION FOR CONDITIONING AND GROOMING THE HAIR

Wolfgang Kastell, Milchstrasse 19, Hamburg, 13, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 339,419, Jan. 15, 1982, abandoned. This application Apr. 27, 1983, Ser. No. 489,066
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109420
Int. Cl.³ A01N 63/02
U.S. Cl. 424—95 7 Claims

1. A process for preparing a hair conditioner, comprising the following steps:
(1) cleaning a bovine heart, including removing fatty residues;
(2) mincing the cleaned heart, to form a pasty mixture;
(3) adding distilled water in approximately the same quantity as the heart;
(4) stirring the pasty mixture and allowing it to stand for approximately 24 hours in a sealed vessel at approximately 4° C.;
(5) filtering the mixture, and separating it into
(a) a filtrate, and
(b) meat residues;
(6) briefly heating the filtrate to boiling until a fine precipitate forms;
(7) filtering the fine precipitate formed in step (6) and recovering the filtrate;
(8) adding approximately the same quantity of ether to the meat residue separated in step (5) (b);
(9) storing the mixture prepared in step (8) for several hours in a sealed vessel at ambient temperature;
(10) filtering the ethereal mixture obtained in step (9), and separating into (a) filtrate and (b) meat residues;
(11) separating the ethereal phase from the filtrate obtained in step (10) (a);
(12) distilling the ether from the ethereal phase obtained in step (11), to obtain a residue;
(13) suspending in water the residue comprising phosphatidyl inositol, phosphatide and phosphatidic acid;
(14) combining the aqueous suspensions or solutions prepared in steps (7) and (13);
(15) adding vegetable lecithin in approximately 2 to 15% by weight to the suspension of step (14);
(16) adding absolute ethanol in approximately the same weight as the suspension of step (15).

4,515,779

SKIN TUMOR REMOVAL AND HEALING COMPOSITIONS AND PROCESSES

John Q. Elliott, Blytheville, Ark., assignor to Arkansas Medical Research & Development Corporation, Blytheville, Ark.

Filed Oct. 23, 1981, Ser. No. 314,241
Int. Cl.³ A61K 33/00, 35/78
U.S. Cl. 424—145 10 Claims

1. An ointment for treating epitheliomal growth on the human skin comprising substantially equal proportions by weight of bloodroot, ginger root and zinc chloride.

4,515,780

ANIMAL NUTRITION

Sebastian M. Laurent, Greenwell Springs, La., and Wilson G. Pond, Hastings, Nebr., assignors to Ethyl Corporation, Richmond, Va. and The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 24, 1983, Ser. No. 497,657
Int. Cl.³ A61K 33/06
U.S. Cl. 424—154 12 Claims

1. A method of inhibiting the formation of urinary calculi in animals, wherein a small amount of synthetic zeolite A up to about five percent by weight is added to the regular feed composition fed to the animals and said feed composition is subsequently regularly fed to the animals.

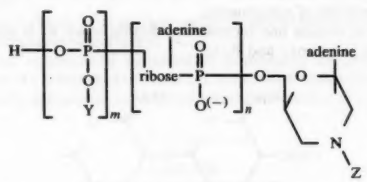
4,515,781

2',5'-RIBOADENYLATE-MORPHOLINOADENYLATE NUCLEOTIDES

Paul F. Torrence, Gaithersberg, Md.; Margaret I. Johnston, Washington, D.C., and Jiro Imai, Kensington, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Feb. 23, 1983, Ser. No. 468,950
Int. Cl.³ A61K 31/70; C07H 15/12, 17/00
U.S. Cl. 514—46 10 Claims

9. A method of blocking the action of interferon produced by animal cells comprising using as an antagonist an effective amount of a nucleotide compound with a 2,5-internucleotide linkage having 1 to 15 ribose-adenine unit and a terminal morpholine unit, having the formula



wherein:
Y is always H except on the terminal phosphate where Y may be H, adenosine, or a C_{1-20} primary or secondary alcohol;
m is 0, 1, 2, 3 or 4;
n is an integer from 1 to 15; and
Z is H or a C_{1-50} hydrocarbon or substituted hydrocarbon bonded through one of its C atoms to the N of the morpholino ring.

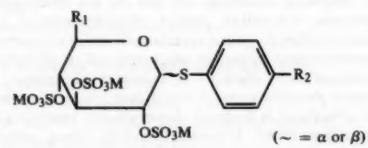
4,515,782

SUBSTITUTED PHENYL-1-THIO(POLY-O-SULFO)-α(OR β)-D-GLUCOPYRANOSIDES

Robert E. Schaub, Upper Saddle River, N.J.; Thomas G. Miner, Chester, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,615
Int. Cl.³ A61K 31/70; C07H 15/00, 15/20
U.S. Cl. 514—24 19 Claims

1. A compound selected from those of the formula:



wherein M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, aluminum, zinc, ammonia and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); R_1 is selected from the group consisting of —$COOCH_3$ and —CH_2OSO_3M; and R_2 is selected from the group consisting of —OCH_3, —NH_2, —$NHCOCH_3$ and —$NHSO_3M$.

4,515,783

4-AMINO-4-DEHYDROXY DERIVATIVES OF EFROTOMYCIN AND RELATED COMPOUNDS

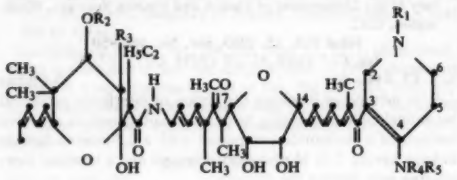
Bruce O. Linn, Bridgewater, and Aino Lusi, Rahway, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 24, 1983, Ser. No. 544,350

Int. Cl.³ A61K *31/71;* **C07H** *3/06*

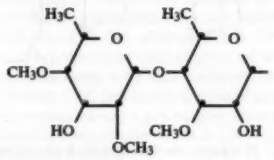
U.S. Cl. 514—27 **20 Claims**

1. A compound having the formula:



wherein the broken line, R_1, R_2 and R_3 have the following combinations of substituents:

(a) the broken line represents a double bond, R_1 is methyl, R_3 is hydroxy and R_2 is:



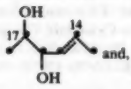
(b) the broken line represents a double bond, R_1 and R_2 are hydrogen and R_3 is hydroxy;

(c) the broken line represents a single bond, R_1 and R_2 are hydrogen and R_3 is hydroxy;

(d) the broken line represents a double bond, R_1 is methyl, R_2 is hydrogen, and R_3 is hydroxy;

(e) the broken line represents a double bond, R_1 is methyl, R_2 and R_3 are hydrogen;

(f) the broken line represents a single bond, R_1 is methyl, R_2 and R_3 are hydrogen and the furan ring at the 14–17 positions is replaced by



for all of the above groups of compounds R_4 and R_5 have the following meanings: R_4 and R_5 are independently hydrogen, loweralkyl, phenyl, phenylloweralkyl, loweralkoxycarbonyl, phenoxycarbonyl, benzyloxycarbonyl, aminocarbonyl, mono- or di(alkylphenyl or phenylalkyl-)aminocarbonyl; dialkoxy or diphenoxyphosphinyl; substituted phenylloweralkyl, substituted loweralkyl wherein the substituent is hydroxy, loweralkoxy, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, cyano, mono- or dimethylamino, carbamoyl, carboxy or loweralkoxycarbonyl; or R_4 and R_5 may be connected to form a heterocyclic ring of 3 to 6 members unsubstituted or substituted with hydroxy, carbonyl, loweralkoxy, loweralkylthio, loweralkylsulfonyl, loweralkylsulfinyl or mono- or diloweralkylamino; and the heterocycle may contain a second heteroatom of oxygen, nitrogen or methyl substituted nitrogen.

17. A method for promoting the growth of ruminant and monogastric animals which comprises administering an effective amount of a compound of claim **1**.

4,515,784

REDUCING SEBUM SPREADING

Rodger E. Bogardus, Trumbull; Jon D. Packer, Stamford, and James P. SaNogueira, Newtown, all of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Nov. 16, 1983, Ser. No. 552,473

Int. Cl.³ A61K *31/695*

U.S. Cl. 514—63 **25 Claims**

1. A method of treating human skin, characterized by an exessive secretion of sebum or by acne, to improve the condition thereof by reducing the spreadability of sebum on the skin surface which comprises topically applying to human skin so characterized a composition for topical skin application comprising, as an active component to reduce sebum spreading, an effective amount of a dimethyl silicone polymer having the formula:

$$(CH_3)_3Si[-OSi(CH_3)_2-]_nCH_3$$

wherein n is a positive integer sufficient to provide a silicone polymer having a molecular weight of 50,000 or more and a viscosity of 10,000 centistokes or more.

4,515,785

NEEM BARK EXTRACTS

Masaki Shimizu, Tokyo; Tadashi Sudo, Honmachi, and Takeo Nomura, Hino, all of Japan, assignors to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 290,877, Aug. 7, 1981, abandoned. This application Sep. 13, 1983, Ser. No. 531,591

Claims priority, application Japan, Aug. 19, 1980, 55-113784; Sep. 8, 1980, 55-124351; Sep. 24, 1980, 55-131669

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195.1 **9 Claims**

1. A neem bark extract which is characterized by being active against mouse L-5178y cells and against transplanted sarcoma 180 tumors produced by contacting the bark of neem which is *Melia azadirachta* with an organic solvent selected from the group consisting of benezene, toluene, xylene, n-hexane, chloroform, carbon tetrachloride and ethylacetate for a time sufficient to form a first liquid extract and a first residue, subjecting said first residue to extraction with a hydrophilic organic solvent selected from the group consisting of methanol, ethanol, propanol, n-butanol, pyridine and acetone for a time sufficient to form a second residue and a second liquid extract comprising solvent and dissolved second extract and removing said solvent from said second extract to form a third residue, dissolving said third residue in a lower alcohol selected from the group consisting of methanol, ethanol, propanol and n-butanol, contacting the resulting solution with a non-polar porous polymer resin having a macroreticular structure in adsorption chromatography whereby said solids of said third residue which are dissolved in said solution are adsorbed on said resin, treating said adsorption resin containing said solids with 10% aqueous methanol followed by elution with from 30 to 50% solutions of methanol and removing the solvent from said eluates to provide said neem bark extract.

4,515,786

11α-AMINO-ANDROSTANES

Gordon H. Phillipps, Wembley; David C. Humber, Ealing; George B. Ewan, Northolt, and Barry A. Coomber, Pinner, all of England, assignors to Glaxo Group Limited, London, England

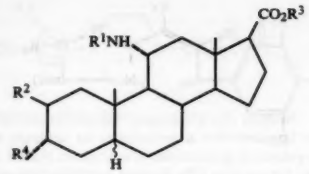
Continuation of Ser. No. 383,338, May 28, 1982, abandoned. This application Jun. 30, 1983, Ser. No. 509,667

Claims priority, application United Kingdom, May 29, 1981, 8116409

Int. Cl.³ C07J *3/00*

U.S. Cl. 514—182 **15 Claims**

1. Compounds of the formula



(I)

wherein

R^1 is a C_{3-8} alkyl group or a C_{3-7} cycloalkyl group;

R^2 is a hydrogen atom, a C_{1-6} alkoxy group or a C_{2-5} alkanoyloxy group;

R^3 is a C_{1-6} alkyl group or a C_{3-7} cycloalkyl group; and

R^4 is a group $—OR^5$ or $—OCOR^6$ where

R^5 is an alkyl or alkenyl group which may contain up to 6 carbon atoms (or such a group substituted by halogen, C_{1-6} alkoxy, carboxy, phenyl, phenyl substituted by nitro, halo, C_{1-4} alkoxy or C_{1-4} alkyl), a C_{3-7} cycloalkyl group, a phenyl group (or such a group substituted by nitro, halo, C_{1-4} alkoxy or C_{1-4} alkyl), or a carbon-attached 5–7 membered heterocyclic ring in which the heteroatom is selected from nitrogen, oxygen and sulphur, and

R^6 is a hydrogen atom or a group R^5 as defined above;

provided that when the compounds contain a 5β-hydrogen atom, R^2 is a hydrogen atom;

and salts thereof.

11. A method of therapy or prophylaxis of a human or animal body suffering from or liable to cardiac dysrhythmias which method comprises administering to the said body an effective amount of a compound of formula (I), or a physiologically acceptable salt thereof as claimed in claim 1.

4,515,787

STEROIDS

Jean G. Teutsch, Pantin; Roger Deraedt, Pavillons-sous-Bois, and Josette Benzoni, Livry Gargan, all of France, assignors to Roussel Uclaf, Paris, France

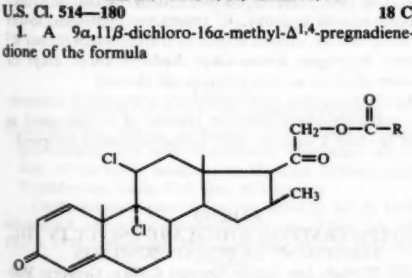
Filed Sep. 15, 1983, Ser. No. 532,739

Claims priority, application France, Oct. 5, 1982, 82 16668

Int. Cl.³ C07J *5/00*; A61K *31/56*

U.S. Cl. 514—180 **18 Claims**

1. A 9α,11β-dichloro-16α-methyl-$\Delta^{1,4}$-pregnadiene-3,20-dione of the formula



(I)

wherein R is selected from the group consisting of trimethylsilylphenyl, cyclododecyloxy, dicyclopentylmethoxy and cyclohexylmethoxy.

13. A method of treating inflammation in warm-blooded animals comprising topically applying to warm-blooded animals an anti-inflammatorily effective amount of at least one compound of claim 1.

4,515,788

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Hamaguchinishi, and Hideaki Yamanaka, Hirakata, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

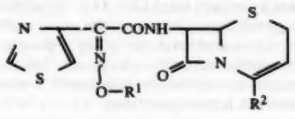
Filed Jul. 27, 1982, Ser. No. 402,256

Claims priority, application United Kingdom, Aug. 3, 1981, 8123683; Oct. 16, 1981, 8131261

Int. Cl.³ C07D *501/20*

U.S. Cl. 514—202 **6 Claims**

1. A compound of the formula:



wherein

R^1 carboxy(lower)alkyl or protected carboxy(lower)alkyl, and

R^2 is carboxy or protected carboxy, and pharmaceutically acceptable salts thereof.

6. An antibacterial composition comprising an effective amount of a compound of claim 1 in association with a pharmaceutically acceptable substantially nontoxic carrier or excipient.

4,515,789

β-LACTAM ANTIBIOTICS

Karl G. Metzger; Wilfried Schröck; Dieter Häbich; Paul Naab, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

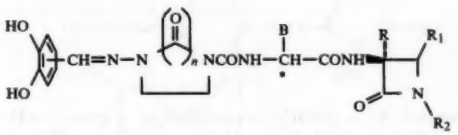
Filed Apr. 7, 1983, Ser. No. 483,062

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3215085

Int. Cl.³ C07D *499/68, 499/70, 501/34, 501/56*

U.S. Cl. 514—196 **18 Claims**

1. A compound of the formula



in which

B represents optionally substituted phenyl or cyclohexadienyl, or an unsaturated, optionally substituted heterocyclic ring;

R represents hydrogen or methoxy;

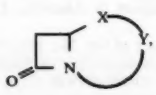
n is 1 or 2;

R_1 is hydrogen or optionally substituted alkyl;

R_2 is $SO_3^{\ominus}M^{\oplus}$; and

$M^{\oplus}$ is a proton or a cation;

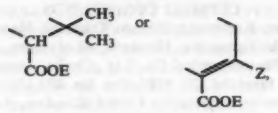
or R_1 and R_2, together with the azetidinone ring to which they are bonded, represent



wherein

X represents S, O, SO, SO_2 or CH_2; and

Y represents



in which the carbon atom which carries the —COOE group is bonded to the nitrogen atom of the β-lactam ring, and

Z represents hydrogen, halogen, alkoxy or —CH_2—T,

T denotes hydrogen, alkyl-CO—O—, pyridinium, carboxamidopyridinium, aminopyridinium, carbamoyloxy, azido, cyano, hydroxyl, the group —S—phenyl which can be substituted, or the group —S—het, in which het represents an optionally substituted 5-membered or 6-membered heterocyclic ring;

and wherein

E represents hydrogen, a pharmaceutically usable ester grouping, a salt-forming cation or a suitable protective group;

or a hydrate thereof.

10. An antibiotically active composition comprising an antibiotically active amount of a compound according to claim **1** in admixture with a diluent.

4,515,790

ANTIPROTOZOAL 2-NITROIMIDAZOLE COMPOUNDS

Werner Hofheinz, Bottmingen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

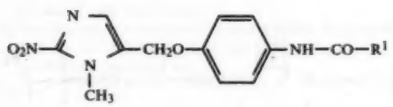
Filed Nov. 24, 1982, Ser. No. 444,106

Claims priority, application Switzerland, Nov. 30, 1981, 7657/81; Sep. 28, 1982, 5701/82

Int. Cl.[3] **A01N** *43/50, 43/60, 43/84;* **C07D** *413/12*

U.S. Cl. 514—234 **11 Claims**

11. A method for the treatment of protozoal infections which comprises administering to a host requiring such treatment an effective amount of a compound of the formula



I

wherein R^1 is 1-methyl-2-pyrrolidinyl or a group —CH_2—NR^2R^3 in which R^2 and R^3 each represent C_{1-4}-alkyl or —NR^2R^3 is the residue of a five-membered or six-membered saturated hetrocyclic ring system selected from the group consisting of pyrrolidine, piperidine, piperzine and morpholine, or a physiologically acceptable acid addition salt thereof.

4,515,791

SUBSTITUTED PHENYL-1,2,4-TRIAZOLO[2,3-b]PYRIDAZIN-3(2H)ONES AS ANTI-ASTHMA AGENTS

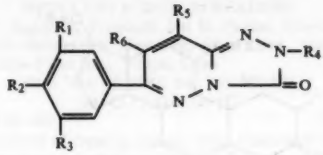
George R. Allen, Jr., Old Tappan, N.J.; John W. Hanifin, Jr.; Daniel B. Moran, both of Suffern, N.Y., and Jay D. Albright, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 156,009, Jun. 3, 1980, abandoned. This application Jun. 15, 1981, Ser. No. 273,818

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/50*

U.S. Cl. 514—248 **3 Claims**

1. The method of meliorating asthmatic conditions in a mammal which comprises administering to said mammal an effective amount of a compound of the formula:



wherein R_1, R_2 and R_3 are each individually selected from the group consisting of hydrogen, fluoro, chloro, bromo, cyano, nitro, amino, alkoxy having up to 6 carbon atoms, trifluoromethyl and thiocarbamoyl with the proviso that at least one of R_1, R_2 and R_3 must be other than hydrogen; and R_4, R_5 and R_6 are each individually selected from the group consisting of hydrogen and alkyl having up to 6 carbon atoms.

2. The compound 6-(3,4-5-trimethoxyphenyl)-1,2,4-triazolo[4,3-b]pyridazin-3(2H)-one.

3. The compound 6-(3-fluoro-4-methoxyphenyl)-1,2,4-triazolo[4,3-b]pyridazin-3(2H)-one.

4,515,792

TETRACYCLIC HETEROCYCLES AND ANTIDEPRESSANT COMPOSITIONS THEREOF

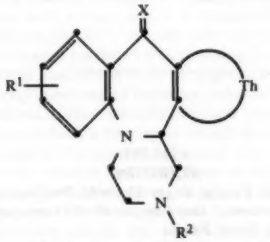
Jeffrey W. H. Watthey, Chappaqua, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,637

Int. Cl.[3] **C07D** *495/14;* **A61K** *31/55*

U.S. Cl. 514—214 **9 Claims**

1. A pyrazinothienobenzazepine of the general formula



(I)

wherein Th represents the divalent radical of the formula —S—CH=CH—, X represents two hydrogens, oxo or hydrogen together with hydroxy, R^1 represents hydrogen, lower alkyl, lower alkoxy, chloro, bromo or trifluoromethyl, and R^2 represents hydrogen, lower alkyl, hydroxy-lower alkyl or aryl-lower alkyl, or an acid addition salt thereof.

9. An antidepressant pharmaceutical composition comprising an antidepressively effective amount of a compound as claimed in claim **1** together with a pharmaceutical excipient.

4,515,793

PHENYLPIPERAZINES WHICH ARE USEFUL IN THE TREATMENT OF SCHISTOSOMIASIS

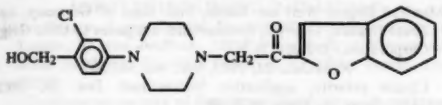
Leslie M. Werbel, Ann Arbor; Norman Colbry, Gregory; William Turner, Ypsilanti, and Donald F. Worth, Ann Arbor, all of Mich., assignors to Edna McConnell Clark Foundation, New York, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,883

Int. Cl.[3] **A61K** *31/495;* **C07D** *241/04, 405/06*

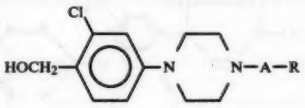
U.S. Cl. 514—252 **4 Claims**

2. 2-(4-(3-Chloro-4-hydroxymethylphenyl)-1-piperazinyl)-1-(2-benzofuranyl)-ethanone of the formula

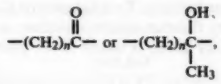


or a pharmacologically acceptable salt thereof.

3. A method of combating a schistosomal infection in a patient which comprises administering to such patient an anti-schistosomal effective amount of a compound of the formula



in which
A is



n is 1, 2 or 3, and
R is phenyl optionally substituted with halogen, alkyl, phenyl, cyano, hydroxy, alkoxy, mercapto, sulfinyl, sulfonyl, amino, nitro, trifluoromethyl and/or naphthyl radicals; or a furan, thiophene, pyridine, benzofuran, dibenzothiophene or thianthrene radical optionally substituted by halogen and/or alkyl of up to 4 carbon atoms,
or a pharmaceutically acceptable salt thereof.

4,515,794

MITOTIC INHIBITORS PREVENTING POSTERIOR LENS CAPSULE OPACIFICATION

Jared M. Emery, Houston, Tex., and Raymond Y. Chan, San Diego, Calif., assignors to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 310,159, Oct. 9, 1981, abandoned. This application Jul. 20, 1983, Ser. No. 516,166
Int. Cl.³ A61K *31/505*
U.S. Cl. 514—249 **3 Claims**

1. A mitotic inhibitor effective to prevent posterior lens capsule opacification when instilled into the anterior chamber of the eye after extracapsular extraction comprising,
an osmotically balanced solution containing a minimum concentration of 0.0454 mg of methotrexate per cc of solution.

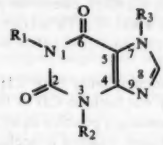
4,515,795

PHARMACEUTICAL COMPOSITIONS

Heinz-Joachim Hinze, Auringen; Alfons Söder, Frankfurt-Schwanheim, and Kurt Popendiker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 485,870, Jul. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 330,653, Feb. 8, 1973, abandoned. This application Mar. 4, 1977, Ser. No. 774,648
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1972, 1810705; Feb. 19, 1972, 2207860; Jul. 11, 1973, 2335170
Int. Cl.³ A61K *31/52*
U.S. Cl. 514—263 **5 Claims**

1. A cerebral-blood-flow increasing pharmaceutical composition containing, as one of plural components and as sole active ingredient, an effective amount of a compound of the formula



(I)

wherein
R_1 is a member selected from the group consisting of ω-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, unbranched (ω-1)-hydroxyalkyl having 5 to 8 carbon atoms, branched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, methyl and —H;
R_2 is a member selected from the group consisting of ω-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, unbranched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms, branched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, and methyl; and
R_3 is a member selected from the group consisting of ω-hydroxyhexyl, unbranched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms, branched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, methyl and —H;
one and only one of R_1, R_2 and R_3 being ω- or (ω-1)-hydroxyalkyl.

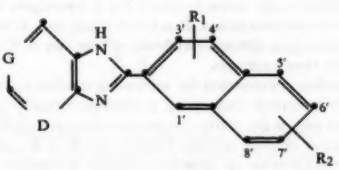
4,515,796

CERTAIN NAPHTHALENYL IMIDAZO COMPOUNDS AND THEIR PHARMACEUTICAL USE

David W. Robertson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 8, 1983, Ser. No. 530,315
Int. Cl.³ A61K *31/435, 31/52;* C07D *471/04, 473/00*
U.S. Cl. 514—303 **20 Claims**

1. A compound of the formulas



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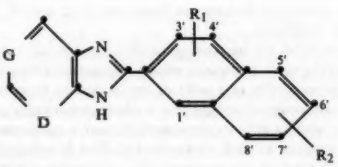
and



Ia

and their pharmaceutically acceptable salts, wherein:
each of R_1 and R_2 is independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, allyloxy, propargyloxy, benzyloxy, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)sulfinyl, (C_1–C_4 alkyl)sulfonyl, hydroxy, halo, cyano, nitro, amino, mono- or di-(C_1–C_4 alkyl)amino, trifluoromethyl or Z-Q-substituted C_1–C_4

alkoxy, wherein Q is oxygen, sulfur, sulfinyl, sulfonyl, or a bond, and Z is C_1–C_4 alkyl, phenyl or phenyl substituted with halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, nitro, amino, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)sulfinyl, or (C_1–C_4 alkyl)sulfonyl; and

G and D are each independently N or CH with the proviso that G and D may not both be CH at the same time.

12. A method of producing a positive inotropic effect, delaying coagulation of the blood, causing bronchodilation, or causing vasodilation in a warm-blooded mammal, which comprises administering to said mammal an effective amount of a compound of claim **1**.

4,515,797

3-AMINO-5-(HYDROXY- AND/OR AMINOPHENYL)-6-(LOWER-ALKYL)-2(1H)-PYRIDINONES AND CARDIOTONIC USE THEREOF

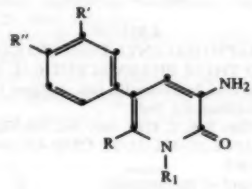
George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 300,294, Sep. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 348,450, Feb. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 248,840, Mar. 30, 1981, abandoned. This application Mar. 5, 1982, Ser. No. 355,229

Int. Cl.³ A61K *31/44*; C07D *211/72*

U.S. Cl. 514—349 **13 Claims**

1. A 1-R_1-3-amino-5-(3-R′-4-R″-phenyl)-6-R-2(1H)-pyridinone having the formula



or acid-addition salt thereof, where R_1 is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is lower-alkyl, and, R′ and R″ are each hydrogen, amino or hydroxy at least one of R′ or R″ being other than hydrogen.

5. A cardiac composition for increasing cardiac contractility, said composition comprising a pharmaceutically acceptable carrier and, as the active component thereof, a cardiotonically effective amount of 1-R_1-3-amino-5-(3-R′-4-R″-phenyl)-6-R-2(1H)-pyridinone or pharmaceutically acceptable acid-addition salt thereof, where R_1 is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is lower-alkyl, and R′ and R″ are each hydrogen, amino or hydroxy at least one of R′ and R″ being other than hydrogen.

8. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a composition comprising a pharmaceutically acceptable carrier and, as active component thereof, a cardiotonically effective amount of 1-R_1-3-amino-5-(3-R′-4-R″-phenyl)-6-R-2(1H)-pyridinone or pharmaceutically-acceptable salt thereof, where R_1 is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is hydrogen or lower-alkyl, R′ and R″ are each hydrogen, amino or hydroxy at least one of R′ and R″ being other than hydrogen.

13. 3-Amino-5-(4-methoxyphenyl)-6-methyl-2(1H)-pyridinone or acid-addition salt thereof.

4,515,798

BENZOYLPARABANIC ACIDS

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

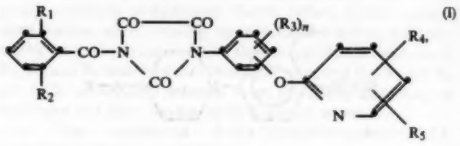
Filed Jun. 23, 1983, Ser. No. 507,257

Claims priority, application Switzerland, Jun. 25, 1982, 3924/82; May 26, 1983, 2870/83

Int. Cl.³ C07D *401/12*; A61K *31/44*

U.S. Cl. 514—341 **16 Claims**

1. A compound of the formula I



(I)

wherein R_1 is hydrogen, halogen or C_1–C_4alkyl; R_2 and R_3, each independently of the other, are halogen or C_1–C_4alkyl; R_4 is hydrogen or halogen; R_5 is halogen or C_1–C_4alkyl which is halogenated by fluorine and/or chlorine; and n is 0, 1 or 2; and the pyridyloxy group is linked to the phenyl group in the 3- or 4-position.

4,515,799

DIHYDROPYRIDINE ANTI-ISCHAEMIC AND ANTIHYPERTENSIVE AGENTS

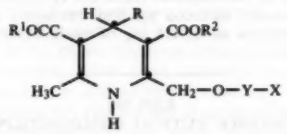
Simon F. Campbell, Deal; Peter E. Cross, Canterbury, and John K. Stubbs, Nordelph, all of England, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 463,095, Feb. 2, 1983, abandoned. This application Jul. 19, 1983, Ser. No. 515,231

Int. Cl.³ A61K *31/44*; C07D *401/12*

U.S. Cl. 514—341 **22 Claims**

1. A 1,4-dihydropyridine compound having the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein:

R is aryl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

Y is $—(CH_2)_n—$, $—CH_2CH(CH_3)—$ or $—CH_2C(CH_3)_2—$; n is an integer from 1 to 3; and

X is imidazolyl or imidazolyl substituted by one or more C_1–C_4 alkyl, phenyl, benzyl, cyano, $—N(R^3)_2$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2(C_1$–C_4 alkyl) or $(CH_2)_mCON(R^3)_2$ groups wherein each R^3 is independently H or C_1–C_4 alkyl and m is 0 or 1; with the proviso that if the imidazolyl is linked to Y by a ring nitrogen atom n is 2 or 3.

4,515,800

METHOD OF LOWERING INTRAOCULAR PRESSURE USING PHENYLIMINO-IMIDAZOLES

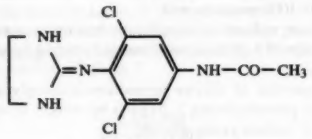
Icilio Cavero, 8 rue Gabriel Fauré94000 Creteil; Salomón Z. Langer, 81, rue Jouffroy, 75017 Paris, both of France, and Billie M. York, Jr., 3828 Winifred Dr., Fort Worth, Tex. 76153

Continuation-in-part of Ser. No. 323,369, Nov. 20, 1981, abandoned. This application Aug. 3, 1983, Ser. No. 520,071

Int. Cl.³ A61K *31/415*

U.S. Cl. 514—392 3 Claims

1. A method for lowering intraocular pressure comprising topically applying to the eye an effective amount for lowering such intraocular pressure of a compound of the formula



or a pharmaceutically acceptable salt thereof.

4,515,801

FUNGICIDALLY ACTIVE PYRANO-PYRAZOLE DERIVATIVES

Hartmut Stegelmeier, Hilden, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

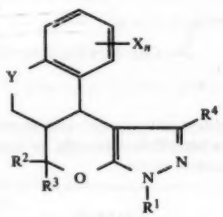
Filed Nov. 8, 1983, Ser. No. 550,076

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243714

Int. Cl.³ A01N *43/90;* C07D *487/02*

U.S. Cl. 514—403 10 Claims

1. A pyrano-pyrazole derivative of the formula



in which

R^1 represents hydrogen, straight-chain or branched alkyl, alkanoyl or alkoxycarbonyl with in each case up to 4 carbon atoms in the alkyl part, phenyl which is optionally monosubstituted or polysubstituted by identical or different substituents or phenylalkyl which has 1 or 2 carbon atoms in the alkyl part and is optionally monosubstituted or polysubstituted by identical or different substituents, possible substituents on the phenyl in each case being: halogen, cyano, nitro, alkyl with up to 4 carbon atoms, alkoxy, alkylthio and dialkylamino with 1 or 2 carbon atoms in the particular alkyl parts, and halogenoalkyl with 1 or 2 carbon atoms and up to 5 identical or different halogen atoms,

R^2 and R^3, which can be identical or different, represent hydrogen, straight-chain or branched alkyl with up to 4 carbon atoms or phenyl which is optionally monosubstituted or polysubstituted by identical or different substituents from the group comprising halogen and alkyl with up to 4 carbon atoms,

R^4 represents straight-chain or branched alkyl or alkoxycarbonyl with in each case up to 4 carbon atoms in the alkyl part, cyano or phenyl which is optionally monosubstituted or polysubstituted by identical or different substituents from the group comprising halogen and alkyl with up to 4 carbon atoms,

Y represents oxygen, sulphur or the methylene group,

X represents halogen, cyano, nitro, straight-chain or branched alkyl with up to 4 carbon atoms, alkoxy, alkylthio or dialkylamino with 1 or 2 carbon atoms in the particular alkyl parts or halogenoalkyl with 1 or 2 carbon atoms and up to 5 identical or different halogen atoms, and

n represents a number from 0 to 3.

9. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,515,802

ANALGESIC PREPARATIONS

Dietmar Römer, Allschwil, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

Filed Mar. 8, 1984, Ser. No. 587,571

Claims priority, application United Kingdom, Mar. 9, 1983, 8306473

Int. Cl.³ A61K *31/48, 31/165, 31/415, 31/475*

U.S. Cl. 514—288 15 Claims

1. A pharmaceutical preparation comprising tizanidine and paracetamol wherein the weight ratio of tizanidine to paracetamol is from about 1:50 to about 1:500.

4,515,803

SUBSTITUTED DERIVATIVES OF OCTAHYDROINDOLE-2-CARBOXYLIC ACIDS

Rainer Henning, Frankfurt am Main; Hansjörg Urbach, Kronberg; Rolf Geiger, Frankfurt am Main; Volker Teetz, Hofheim am Taunus, and Bernward Schölkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschafat, Frankfurt am Main, Fed. Rep. of Germany

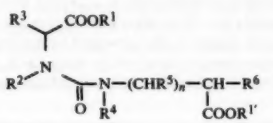
Filed Sep. 1, 1982, Ser. No. 413,663

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134933

Int. Cl.³ A61K *51/405;* C07D *209/12*

U.S. Cl. 514—338 13 Claims

1. A compound of the formula I



I

in which

n is a whole number between 0 and 3 inclusive;

R^1 and $R^{1'}$, being the same or different, are hydrogen; alkyl or alkenyl having 1–8 C atoms; phenyl or benzyl, each unsubstituted or monosubstituted by methyl, halogen, methoxy or nitro;

R^2 and R^3 together with the C and N atoms carrying them form an octahydroindole ring system, which is unsubstituted, monosubstituted or disubstituted by hydroxyl, alkoxy having 1–3 C atoms, alkyl having 1–3 C atoms or phenyl;

R^4 is hydrogen; alkyl, alkenyl, alkadienyl, alkinyl, alkeninyl or alkadiinyl having 1–8 C atoms; cycloalkyl having 3–6 C atoms; phenyl, benzyl, phenethyl or phenylpropyl, each of which is unsubstituted, monosubstituted or disubstituted by halogen, hydroxyl, acetoxy, carboxy, carboxamido, sulfonamido, nitro, methyl, ethyl, methoxy, ethoxy or methylenedioxy;

R^5 is hydrogen; alkyl having 1–5 C atoms; hydroxyl or alkoxy having 1–3 C atoms;

R^6 is hydrogen; alkyl having 1–12 C atoms; cycloalkyl having 3–12 C atoms; alkenyl having 2–12 C atoms; phenyl or naph-

thyl, each of which is unsubstituted, monosubstituted or disubstituted by halogen, hydroxyl, acetoxy, carboxy, carboxamido, sulfonamido, nitro, methyl, ethyl, methoxy, ethoxy or methylenedioxy; alkyl having 1–6 C atoms, which is monosubstituted by halogen, hydroxyl, alkoxy having 1–3 C atoms, phenoxy, amino, dialkylamino having 1–6 C atoms, alkanoylamino having 1–3 C atoms, mercapto, alkylthio having 1–3 C atoms, phenylthio, phenylsulfinyl, phenylsulfonyl, phenyl, biphenylyl, or naphthyl, the phenyl or naphthyl each being unsubstituted, monosubstituted or disubstituted by halogen, methyl, ethyl, methoxy, ethoxy, nitro, amino, methylamino, dimethylamino, acetylamino, cyano, methylenedioxy or sulfonamido; heteroaryl selected from the group consisting of pyridyl, thienyl, indolyl, benzothienyl, imidazolyl, pyrazolyl and thiazolyl, said heteroaryl being unsubstituted, monosubstituted or disubstituted by halogen, methyl, ethyl, methoxy, ethoxy, nitro, amino, methylamino, dimethylamino, acetylamino, cyano, methylenedioxy, sulfonamido or phenyl; or physiologically tolerable salts thereof.

13. A method of treatment which comprises administering to a patient suffering from hypertension a hypotensively effective amount of a compound defined in claim 1.

4,515,804

CRYSTAL MODIFICATIONS OF (+)-CATECHIN AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Erwin Marti; Oskar Heiber, both of Basel; Alexandre Gumma, Commugny; Gustave Huber, Crans, all of Switzerland; Isamu Utsumi; Hiroshi Nakagawa, both of Kyoto, Japan; Tatsuhiko Miyata, and Koichi Akimoto, both of Osaka, Japan, assignors to Zyma SA, Nyon, Switzerland

Filed Feb. 17, 1983, Ser. No. 467,540

Claims priority, application United Kingdom, Feb. 24, 1982, 8205453

Int. Cl.³ A61K *31/35;* C07D *311/62*

U.S. Cl. 514—456 **3 Claims**

1. (+)-Catechin α-monohydrate in a crystal form, which is free of substantially free from other known crystalline forms of (+)-catechin, and which is characterized by having an X-ray powder diffraction spectra obtained by using Cu:$K_{\alpha 1}$-rays, the following seventeen lattice distances and relative intensities:

Lattice Distance in Å	Relative Intensities
7.17 ± 0.10	very strong
6.17 ± 0.06	medium
5.95 ± 0.06	medium
4.49 ± 0.04	strong
4.39 ± 0.04	medium
4.20 ± 0.04	strong
4.13 ± 0.04	strong
3.97 ± 0.03	medium
3.84 ± 0.03	strong
3.78 ± 0.03	medium
3.75 ± 0.03	medium
3.65 ± 0.03	very strong
3.58 ± 0.03	medium
3.41 ± 0.02	medium
3.37 ± 0.02	medium
3.24 ± 0.02	medium
3.19 ± 0.02	medium.

2. In a method of treating hepatitis with an effective amount of a crystalline form of (+)-catechin, the improvement wherein the (+)-catechin is a crystal modification of (+)-catechin monohydrate according to claim 1.

4,515,805

SOLUBLE SODIUM CROMOGLYCATE COMPOSITIONS

Peter M. Newman, Keyworth, and Anthony W. Jenkins, Loughborough, both of England, assignors to Fisons plc, Ipswich, England

Continuation of Ser. No. 315,958, Oct. 28, 1981, abandoned. This application Jul. 21, 1983, Ser. No. 515,608

Claims priority, application United Kingdom, Nov. 5, 1980, 8035457

Int. Cl.³ A61K *31/35*

U.S. Cl. 514—460 **10 Claims**

1. A water-soluble composition for treatment of a condition of a gastro-intestinal tract comprising:

a particulate water-soluble pharmaceutically acceptable carrier consisting essentially of sucrose and having a particle size of 200–1000 microns; and

particulate sodium cromoglycate having a mass median diameter of 2–30 microns forming a coating on said carrier particles.

the proportion of carrier to sodium cromoglycate in the coated particles being 2–20 parts by weight of carrier to 1 part of sodium cromoglycate.

4,515,806

FURAN DERIVATIVES AND ADDITION SALTS THEREOF PHARMACEUTICAL COMPOSITIONS AND THE THERAPEUTICAL APPLICATIONS THEREOF

José M. Calderó Ges, and Eusebio M. Fabá, both of Barcelona, Spain, assignors to Inke, S.A., Barcelona, Spain

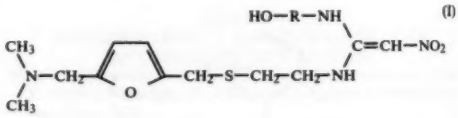
Filed Mar. 23, 1983, Ser. No. 478,052

Claims priority, application Spain, Apr. 16, 1982, 511.896; May 21, 1982, 512.419; Jan. 26, 1983, 519.286; Jan. 26, 1983, 519,287

Int. Cl.³ A61K *31/34;* C07D *307/52*

U.S. Cl. 514—471 **5 Claims**

1. Furan derivatives having the general formula:



(I)

and the acid addition salts thereof with pharmaceutically acceptable acids, where R is a straight or branched alkylene chain of 1 to 6 carbon atoms.

4,515,807

THIOGLYCINE DERIVATIVES AND USE AS FUNGICIDES

Jean-Claude Debourge, Champagne au Mont d'Or, and Guy Lacroix, Lyons, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

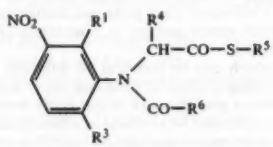
Filed Sep. 29, 1982, Ser. No. 427,304

Claims priority, application France, Oct. 6, 1981, 81 18915

Int. Cl.³ C07C *153/023;* A01N *37/14*

U.S. Cl. 514—513 **14 Claims**

1. A product of the formula:



(I)

in which:

R^1 and R^3, which are identical or different, represent an alkyl

radical having from 1 to 4 carbon atoms and are preferably the methyl radical,

R^4 represents the hydrogen atom or a methyl radical,

R^5 represents the hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms,

R^6 represents an optionally monohalogenated or dihalogenated alkyl radical having from 1 to 6 carbon atoms, a cycloalkyl radical having from 3 to 6 carbon atoms or a radical $—CH_2—X—R^7$,

X represents the oxygen or sulphur atom, and

R^7 represents an alkyl radical having from 1 to 4 carbon atoms.

7. A composition which is useful in protecting plants against fungal diseases, which composition comprises a fungicidally effective amount of a compound of claim 1 as the active ingredient, in association with an agriculturally acceptable inert carrier, surface-active agent or mixture thereof.

13. A process for combating fungal diseases in plants, which comprises applying to the plant a fungicidally effective amount of the composition of claim 7.

4,515,808

PESTICIDES

Michael Elliott, Stevenage; Norman F. Janes, Luton, and Bhupinder P. S. Khambay, Harrow Weald, all of England, assignors to National Research Development Corporation, London, England

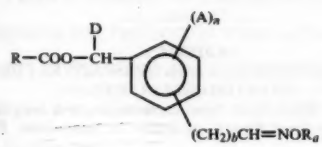
Filed Jul. 26, 1983, Ser. No. 517,441

Claims priority, application United Kingdom, Jul. 26, 1982, 8221501

Int. Cl.³ A01N *53/00;* **C07C** *121/78*

U.S. Cl. 514—521 **22 Claims**

1. A compound of the formula:



1

wherein

D represents hydrogen or a cyano group or an ethynyl group;

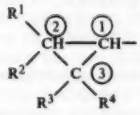
R_a represents an alkyl group;

A represents an alkyl group or a halogen or trifluoromethyl group;

n is 0 or an integer of 1–4,

b is 0 or 1; and

R is selected from the group consisting of:



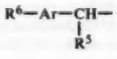
(a)

wherein

R^3 and R^4 each represent an alkyl group which may be the same or different;

R^2 represents hydrogen or an alkyl group; and

R^1 represents hydrogen or a substituted or unsubstituted acyclic or carbocyclic group; and



(b)

wherein

Ar represents an aryl residue;

R^5 represents a saturated or unsaturated straight chain or branched acyclic or cyclic hydrocarbon residue; and

R^6 represents hydrogen or at least one alkyl, alkoxy, substituted alkoxy or halogen substituent; the R^6 groups, when more than one is present, being the same or different.

4,515,809

DERIVATIVES OF BENZOYLPHENOXYALKANOIC ACIDS HAVING NORMOLIPEMIZING ACTIVITY

Valerio Borzatta; Manlio Cristofori; Mauro Morotti, all of Bologna, and Giuseppe Mascellani, Calderino di M.S. Pietro, all of Italy, assignors to Alfa Farmaceutici S.p.A., Bologna, Italy

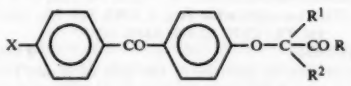
Division of Ser. No. 123,454, Feb. 21, 1980, , which is a continuation of Ser. No. 29,006, Apr. 11, 1979, abandoned. This application Apr. 20, 1981, Ser. No. 255,431

Claims priority, application Italy, May 9, 1978, 3426 A/78; Dec. 21, 1978, 3630 A/78

Int. Cl.³ A61K *31/235;* **C07C** *69/616*

U.S. Cl. 514—533 **9 Claims**

1. A compound of the formula:

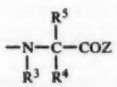


wherein:

X represents an atom of chlorine, bromine, iodine or an alkyl group having 1 to 4 carbon atoms;

R^1 and R^2, equal or different from each other, represent a hydrogen atom or an alkyl group or a hydroxyalkyl group, said groups having 1 to 6 carbon atoms;

R represents a group selected from:



wherein:

R^3 represents a hydrogen atom or an alkyl group,

R^4 and R^5, equal or different from each other, represent a hydrogen atom or an alkyl, an hydroxyalkyl, mercaptoalkyl, alkylphenyl, or phenyl group, wherein the alkyl groups have up to 6 carbon atoms and each phenyl group may have an OH substituent and

Z represents an alkoxy group having 1 to 6 carbon atoms; and

$—O—CH_2—COZ$

wherein Z has the meaning given above;

or a pharmaceutically acceptable salt of said compound.

9. A pharmaceutical preparation useful in the therapy of hyperlipaemia and of hypercholesterolemia, characterized in that it contains a hypolipaemic or hypocholesterolemic effective dose of at least one of the compounds of claim 1 associated or combined with one or more usual excipients or solvents.

4,515,810

COMPOSITION OF MATTER

San-Laung Chow, Nanuet, and Bernard Sims, Monsey, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 6, 1983, Ser. No. 539,450

Int. Cl.³ A61K *31/22*

U.S. Cl. 514—530 **15 Claims**

5. A pharmaceutical composition of matter useful as a topical medicament which comprises a therapeutically effective

amount of a water unstable E-type prostaglandin compound, 10–20% of emulsifying wax, N.F., 70–90% of mineral oil and 5–20% of diisopropyl adipate.

15. A method of making a pharmaceutical composition of matter according to claim 5, comprising the steps of mixing together the emulsifying wax and mineral oil on a steam bath at 55° C. until a clear solution is obtained, dissolving 7-[2β-(4-butyl-4-hydroxy-1,5-hexadienyl)-3α-hydroxy-5-oxo-1α-cyclopentyl]-5-heptenoic acid, methyl ester in the diisopropyl adipate on a steam bath at 55° C., mixing the emulsifying wax/mineral oil mixture with the diisopropyl adipate containing the active ingredient on a steam bath at 55° C. until a clear solution is obtained and cooling to room temperature.

4,515,811

PROCESS FOR THE RESOLUTION OF D,1 2-(6-METHOXY-2-NAPHTHYL)PROPIONIC ACID

Percy G. Holton, Menlo Park, Calif., assignor to Syntex Corporation, Panama, Panama

Continuation-in-part of Ser. No. 55,258, Jul. 6, 1979, abandoned, and a continuation-in-part of Ser. No. 97,118, Nov. 26, 1979, Pat. No. 4,246,193. This application Jun. 4, 1980, Ser. No. 156,250

Int. Cl.³ C07C *91/00*; A61K *31/19*

U.S. Cl. 514—554 **9 Claims**

1. A diastereomeric mixture of the salts of d and l 2-(6-methoxy-2-naphthyl)propionic acid with N-R-D-glucamine, wherein R is cycloalkyl having 3 to 8 carbon atoms.

3. A method of treating inflammation, pain or pyrexia in mammals which comprises administering to a mammal suffering therefrom a therapeutically effective amount of a salt of d 2-(6-methoxy-2-naphthyl)propionic acid with N-R-D-glucamine, where R is cycloalkyl having 3 to 8 carbon atoms.

4,515,812

COMBATING FUNGI WITH N-SULPHENYLATED UREAS

Engelbert Kühle, Berg.-Gladbach; Wilhelm Brandes, Leichlingen, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

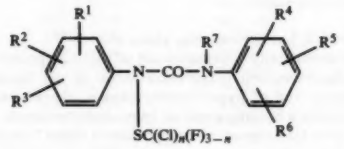
Division of Ser. No. 290,899, Aug. 7, 1981, Pat. No. 4,397,869. This application Apr. 4, 1983, Ser. No. 481,700

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032327

Int. Cl.³ C07C *127/19*; A01N *47/28*

U.S. Cl. 514—592 **13 Claims**

1. An N-sulphenylated urea of the formula



in which

R^1 to R^6 each independently is hydrogen, halogen, nitro, cyano, alkyl, alkoxy, alkylmercapto, trihalogenomethyl-, trihalogenomethoxy or trihalogenomethylmercapto,

R^7 is hydrogen or alkyl, and

n is 0, 1 or 2,

both of the phenyl rings being substituted by other than hydrogen.

12. A method of combating fungi comprising applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

4,515,813

LEPIDOPTERICIDAL ISOTHIOUREA COMPOUNDS

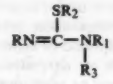
Llewellyn W. Fancher, New Castle, and Herbert B. Scher, Moraga, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 185,462, Sep. 9, 1982, Pat. No. 4,357,351. This application Sep. 29, 1982, Ser. No. 426,366

Int. Cl.³ C07C *127/26*; A01N *47/42*

U.S. Cl. 514—563 **24 Claims**

1. A compound having the formula

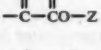


wherein

R and R_1 are independently selected from the group consisting of C_2–C_{10} alkyl, C_2–C_{10} alkoxyalkyl, and phenyl and R and R_1 together contain from 12 to 22 carbon atoms;

R_2 is selected from the group consisting of C_1–C_{14} alkyl, C_3–C_{10} alkenyl, and C_3–C_4 alkynyl; and

R_3 is selected from the group consisting of



wherein Z is selected from the group consisting of —C-$_1$–C_{18} alkyl, hydrogen, Al^{+++}, NH_4^+ and Ca^{++}.

17. A method for controlling lepidoptera comprising applying said lepidoptera or the locus or feedstuffs thereof a lepidopterically effective amount of the compound of claim 1.

4,515,814

3-PHENOXYPROPAN-2-OL DERIVATIVES FOR TREATING GLAUCOMA

Alexander E. Wick, Saint Nom La Breteche, and Jean Binet, Breuillet, both of France, assignors to Synthelabo, Paris, France

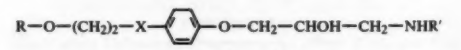
Filed Aug. 30, 1982, Ser. No. 412,962

Claims priority, application France, Sep. 10, 1981, 81 17137

Int. Cl.³ A61K *31/135*; C07C *91/32, 91/34*

U.S. Cl. 514—652 **5 Claims**

1. A method for the treatment of a patient with glaucoma which comprises administering to such patient a 3-phenoxypropan-2-ol derivative, in the form of a racemate or an enantiomer, of the formula:



wherein

R is a cycloalkyl radical having 5 or 6 carbon atoms,

X is an oxygen atom or a bond, and

R' is isopropyl or tert.-butyl or a pharmaceutically acceptable acid addition salt thereof, in an amount effective to alleviate the glaucoma condition.

4,515,815

LOW SODIUM CHLORIDE RIPENED RENNET CHEESES BY ULTRAFILTRATION

Frank V. Kosikowski, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,926

Int. Cl.³ A23C *19/05*

U.S. Cl. 426—40 **10 Claims**

1. In a process of making a ripened rennent cheese selected from the group consisting of a Cheddar, low moisture Mozza-

rella, Swiss and Blue wherein a milk component is coagulated and ripened, the improvement which comprises

(a) employing as the starting milk component a milk containing an enriched protein level wherein the enriched protein level to original milk protein level is about 1.3:1 to about 1.9:1, where said protein level is obtained by ultrafiltration of milk, and

(b) employing reduced levels of sodium chloride in the cheese making process sufficient to reduce the level of sodium chloride in the resultant ripened cheese by at least about 10% from the levels present in the conventional cheese, thereby providing a cheese without significantly affecting flavor, body and texture properties.

4,515,816

PROCESSING OF LIGNOCELLULOSE MATERIALS

Wilson B. Anthony, Riesel, Tex., assignor to Agro-Systems, Inc., Muscle Shoals, Ala.

Filed Feb. 23, 1983, Ser. No. 469,131
Int. Cl.³ A23K *1/22*
U.S. Cl. 426—69 **11 Claims**

1. A process for treating lignocellulose-containing material to render it amenable to digestion by ruminant animals comprising: adding dilute aqueous acid to the material to form a wet mass in which the pH is in the range of about 2–3, the concentration of the added acid being sufficient to effect acid hydrolysis of the lignocellulose-containing material without charring thereof; storing the wet acidified mass in a low oxygen environment in a closed vessel for a time period of about 5 to about 21 days under ambient conditions of temperature and pressure; and drying the wet acidified mass thereby enhancing the effect of the acid on the mass.

4,515,817

METHOD FOR PRODUCING UNDULATED DOUGH PRODUCTS

Mario Pavan, Via Montegrappa, 10, Galliera Veneta, Italy

Filed May 11, 1981, Ser. No. 262,725
Claims priority, application Italy, May 15, 1980, 22096 A/80
Int. Cl.³ A23L *1/00*; A23C *3/00*
U.S. Cl. 426—106 **3 Claims**

1. A method for producing a pre-cooked shaped dough product, comprising the steps of continuously producing a sheet of fresh dough having a widthwise extension and a longitudinal extension, advancing said sheet in the longitudinal direction thereof, pre-cooking said sheet of fresh dough, forming undulations extending substantially widthwise of said pre-cooked sheet of dough while simultaneously drying said dough sheet to stabilize said undulations and further drying and cutting said dough sheet to size.

4,515,818

PROCESS FOR PREPARING SUNFLOWER BUTTER SPREAD FROM PRETREATED SUNFLOWER SEEDS

Bruce E. MacDonald; Geoffrey Galloway, both of Saskatoon, and Yukio Kakuda, Guelph, all of Canada, assignors to CSP Foods Ltd., Saskatoon, Canada

Filed Mar. 3, 1982, Ser. No. 354,378
Int. Cl.³ A23L *1/20, 1/36*
U.S. Cl. 426—268 **9 Claims**

1. In a process for the preparation of sunflower butter from dehulled sunflower seeds which contain phenolic compounds producing discoloration thereof including forming butter from the seeds and deaerating, chilling and tempering the butter, the improvement comprising prior to the forming of the butter applying to the seeds a solution containing 0.05% to 5.0% by weight of a reducing agent selected from the group consisting of ascorbic acid, erythorbic acid, hydroquinone, formaldehyde and ascorbyl palmitate to the seeds at a temperature above 1° C. such that the seeds absorb between 40% and 70% by weight of the solution, following which prior to any reformation of the discoloration, drying the seeds and roasting at a temperature and time at least sufficient and up to 240° C. to produce a light brown color.

4,515,819

PROCESS OF MAKING ENCRUSTED BAKERY PRODUCTS

Tatsuo Shinriki, Chiba, Japan, assignor to Height Inc., Chiba, Japan

Continuation-in-part of Ser. No. 357,314, Mar. 11, 1982, Pat. No. 4,446,160, which is a division of Ser. No. 224,833, Jan. 13, 1981, Pat. No. 4,334,464. This application Oct. 14, 1983, Ser. No. 542,194
Claims priority, application Japan, Jan. 16, 1980, 55-3197
The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.
Int. Cl.³ A23P *1/00*
U.S. Cl. 426—297 **7 Claims**

1. A process of covering a ball of sticky edible paste material to form an edible product, comprising the steps of:

(1) depositing a ball of edible pasty filling onto a film of thin, flexible edible material such that the film sticks to and covers the lower portion of the ball so as to prevent the ball from undesirably sticking to other surfaces during said process;

(2) merging the composite of the ball and the film with a sheet of flattened glutenous dough by depositing the sheet of dough on the ball and film so as to cover the ball, such that the sheet of dough includes a skirt portion draped over the ball and film; and

(3) gathering the skirt portion of the dough sheet underneath the ball and film such that the margins of the skirt portion are brought together and the ball and film are enclosed.

5. A process of covering a ball of sticky edible paste material to form an edible product, comprising the steps of:

(1) depositing a ball of edible pasty filling onto a sheet of flattened glutenous dough;

(2) depositing a film of thin, flexible edible material onto the ball to as to stick to and cover at least the upper portion of the ball to prevent the ball from sticking undesirably to other surfaces during said process;

(3) inverting and depositing onto a conveyor belt, the composite of the ball of pasty filling, the sheet of dough, and the film, such that the film is on the conveyor belt, the ball is on the film, and the sheet of dough covers the ball and film such that the sheet of dough includes a skirt portion draped over the ball and film; and

(4) gathering the skirt portion of the sheet of dough underneath the ball and film such that the margins of the skirt are brought together and the ball and film are enclosed.

4,515,820

METHOD FOR COATING AND INFUSING NUT PRODUCTS WITH HONEY-SUCROSE SOLUTION FOR ROASTING

Charlene Tang, 2300 Wilcrest #78, Houston, Tex. 77042

Filed Dec. 16, 1982, Ser. No. 450,219
Int. Cl.³ A23L *1/36*
U.S. Cl. 426—309 **7 Claims**

1. A method for preparing nut products by applying a crispy, golden-brown glaze to the outer surface, consisting essentially of the steps of:

(a) preparing a solution comprising 50%–70% by weight sucrose, 10%–20% by weight honey and the balance water;

(b) heating said solution to no greater than the soft-ball stage;

(c) coating shelled nuts with said solution until the nuts become at least partially saturated with the solution;
(d) drying the coated nuts at least to where there is no excess solution left to interrupt a subsequent roasting process;
(e) roasting the coated nuts until they have a golden brown transparent glaze.

4,515,821

CALCINED SILICAS AND THEIR USE IN BEER CLARIFICATION

Brian H. Armstead, Cheshire, and James P. Quinn, Merseyside, both of England, assignors to Internationale Octrooi Maatschappij "Octropa", Rotterdam, Netherlands

Filed Sep. 8, 1983, Ser. No. 530,363
Claims priority, application United Kingdom, Sep. 8, 1982, 8225651
Int. Cl.³ C12H *1/04*
U.S. Cl. 426—330.4 **6 Claims**

1. A process for the treatment of beer, which comprises contacting the beer with a calcined silica xerogel having a surface area in the range 100 to 450 m^2/g, a pore volume of at least 0.66 cc/g and an MPD greater than 100 A and having, in its infra-red spectrum, a peak at 3760 cm^{-1}, indicating the presence of single surface silanol groupings, to produce, in the ratio absorbence at 3760 cm^{-1} over absorbence at 1890 cm^{-1}, a number above 2.2, the amount of silica being effective to clarify the beer, and separating the silica from the beer.

4,515,822

HOLLOW, PUFFED FRUIT PRODUCTS AND METHODS OF PREPARATION

Leon Kraig, Plymouth, and Mathew Langenfeld, Eagan, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 29, 1983, Ser. No. 526,942
Int. Cl.³ A23L *1/04, 1/18*
U.S. Cl. 426—445 **16 Claims**

1. A method for preparing a dried, simulated hollow fruit product comprising in sequence the steps of:
(A) contacting a solution with a bath to form encapsulated pieces, said solution comprising
(1) about 40 to 70% moisture
(2) about 1 to 6% sweeteners, and
(3) about 0.5 to 2.0% hydrophilic colloid (wet basis) said bath containing a gel setting agent capable of causing the hydrophilic colloid to set up an encasement around said pieces; immediately thereafter,
(B) first drying the pieces with forced convection drying with hot air at about 220° to 280° F. to a moisture content of less than about 20%, to form hollow cored pieces; and
(C) finish drying the hollow cored fruit pieces to a moisture content of about 5 to 10% to form a hollow centered dried simulated fruit piece having a density of about 0.15 to 0.40 g./cc.

4,515,823

PROCESS FOR SEPARATION OF RAW MILK INTO CREAM AND SKIM MILK WHICH IS PASTEURIZED

Bernd R. G. Kirschenmann, Hamburg, Fed. Rep. of Germany, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 31, 1983, Ser. No. 480,882
Claims priority, application Sweden, Mar. 31, 1982, 8202048
Int. Cl.³ A23C *1/00*
U.S. Cl. 426—491 **3 Claims**

1. In the processing of milk by centrifugally separating a flow of raw milk into a stream of skim raw milk and a stream of cream, heating said milk flow to a separating temperature prior to said centrifugal separating, heating said skim milk stream in a first heat exchanger section and then further heating it to pasteurization in a second heat exchanger section by heat exchange with a hot medium, cooling the pasteurized skim milk stream by heat exchange in said first heat exchange section, then further cooling said pasteurized skim milk stream in a third heat exchanger section, and cooling said cream stream in an additional heat exchanger section, the improvement which comprises dividing said raw milk flow into first and second partial streams prior to said centrifugal separating, heating said first partial stream in said third heat exchanger section, heating said second partial stream in said additional heat exchanger section, and then combining said partial streams and subjecting them to said centrifugal separating.

4,515,824

PREPARATION OF CAKES AND NO-STIR DRY MIX FOR THEIR PREPARATION

Jon R. Blake, Brooklyn Center; Richard K. Knutson, Corcoran, and Glenn J. VanHulle, Brooklyn Park, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 18, 1982, Ser. No. 409,204
Int. Cl.³ A23D *10/04*
U.S. Cl. 426—554 **14 Claims**

1. A dry mix for cakes, comprising flour, sugar, leavening, flavor, and color in the form of granules, said granules having:
A. a particle size of from about 0.9 to 3.0 mm.;
B. a bulk porosity of from about 0.55 to 0.64;
C. a density of from about 0.45 to 0.7 g./cc.;
D. an initial rate of moisture absorption of from about 0.055 to 0.075 gram of water per gram of mix per second; and
E. a moisture content of less than about 5%.

4,515,825

LOW FAT SPREAD AND PROCESS FOR PRODUCING SAME

David P. J. Moran, Covington, and David G. Sharp, Putnoe, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,986
Claims priority, application United Kingdom, Oct. 7, 1981, 8130323
Int. Cl.³ A23D *3/00, 3/02*
U.S. Cl. 426—603 **27 Claims**

1. In a low fat spread comprising 20 to 60 wt.% fat, which comprises:
(i) a dispersed phase consisting of a cream comprising a protein, an oil which is present as droplets of an average diameter ranging from 0.1 to 2 microns and an effective amount of a thickening agent sufficient to impart creaminess to the resulting spread; and
(ii) a continuous fat phrase wherein the improvement consists of using heat denatured whey protein in the dispersed phase, the whey protein having been obtained by membrane filtration.

4,515,826

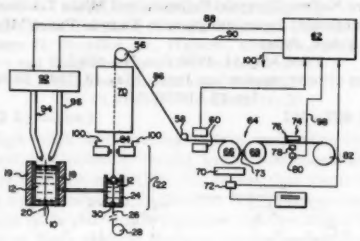
METHOD OF PRODUCTION OF DIELECTRIC INSULATION LAYERS UPON ELECTRICAL CONDUCTORS

John N. Garner, Kingston, and Michael A. Shannon, Glenburnie, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 6, 1984, Ser. No. 597,394
Int. Cl.³ B05D *3/14*
U.S. Cl. 427—8 **8 Claims**

1. A method of monitoring net inherent bipolar orientation of magnetically permeable particles in a dry dielectric carrier layer surrounding an electrical conductor comprising:
passing the conductor carrying the layer through a magnetic field to cause the orientation of the particles to affect the magnetic flux strength in at least one certain part of the field; and
inducing an electrical property in a sensing conductor placed in said certain part of the field, and sensing with said sensing

conductor any change in the value of the electrical property, said change corresponding to a change in the net orientation

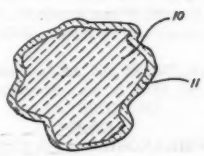


of the particles which affect the flux strength in said certain part of the field.

4,515,827
METHOD OF VAPOR COATING PHOSPHOR PARTICLES

Robert E. Dodds, San Diego, Calif., and David J. Harrigan, Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 188,634, Sep. 19, 1980, Pat. No. 4,398,119. This application Jun. 17, 1982, Ser. No. 389,203
Int. Cl.³ C09K *11/08*
U.S. Cl. 427—68 **7 Claims**



1. A method for producing a composite article of manufacture comprising a phosphor particle and a continuous coating on the surface of the particle, the method comprising:

(a) evacuating a chamber containing: phosphor particles; means to rotate the phosphor particles; a color modifying material; and heating means to vaporize the color modifying material;

(b) rotating the phosphor particles while;

(c) heating the color modifying material to vaporize it, whereby the color modifying material is vapor deposited on the rotating phosphor particles to form a continuous coating.

4,515,828
PLANARIZATION METHOD

James Economy, and Mary A. Flandera, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1981, Ser. No. 222,195
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—82 **8 Claims**

1. A method of providing a planarized coating on a surface comprising the steps of

applying a uniform coating of a prepolymer material selected from the group consisting of diacetylenic prepolymers, novolaks, epoxies and polyimides to said surface,

heating said prepolymer to melt said prepolymer to a low viscosity, maintaining said low viscosity prepolymer in a melted phase for a sufficient length of time to permit said prepolymer to flow to form a planarized layer on said surface, and

curing said planarized prepolymer into a planarized layer.

4,515,829
THROUGH-HOLE PLATING

Cheryl A. Deckert, Framingham; Edward C. Couble, Brockton, and William F. Bonetti, Boston, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Oct. 14, 1983, Ser. No. 542,036
Int. Cl.³ H05K *3/42, 3/46*
U.S. Cl. 427—97 **20 Claims**

1. A process for the manufacture of a printed circuit board having a plurality of metal plated holes interconnecting at least two circuits comprising the steps of, in either order, forming holes in an epoxy printed circuit board material and forming the circuits and thereafter, metallizing the holes, said metallization comprising a pretreatment sequence between the steps of forming the holes and metal plating including the steps of contact of the holes with a first aqueous alkaline solution of an oxygenated epoxy solvent at a pH greater than 10 and at a temperature and for a time sufficient to soften the hole walls, contact with a second solution comprising an aqueous alkaline solution of permanganate ions maintained at an elevated temperature and a pH in excess of 13, and contact with a third solution of a reducing agent for permanganate ions at a temperature and for a time sufficient to remove any manganese residues remaining on the walls of the holes.

4,515,830
SOLVENT-CAST CAPACITIVE HIGH DENSITY INFORMATION DISC

Louis A. DiMarco, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1983, Ser. No. 556,355
Int. Cl.³ B05D *5/12;* C04B *35/00;* C09K *3/00*
U.S. Cl. 427—122 **10 Claims**

1. A method of forming a conductive, high density information disc suitable for capacitive readout which comprises:

(a) blending a composition comprising from about 70 to about 85 percent by weight of a thermoplastic resin, from about 12 to about 20 percent by weight of finely divided particulate conductive carbon black, and stabilizers, processing aids and lubricants compatible therewith;

(b) thermally processing said composition by heating under high shear to form a melt having the carbon particles uniformly dispersed therein;

(c) mixing the thermally processed composition with a suitable organic solvent to form a dispersion of the conductive carbon black in a solution of the remaining ingredients;

(d) filtering said dispersion to remove particles larger than 25 micrometers;

(e) coating the dispersion onto a core disc;

(f) drying the coating to form a conductive layer from about 5 to about 40 micrometers in thickness; and

(g) embossing the conductive layer with an information track.

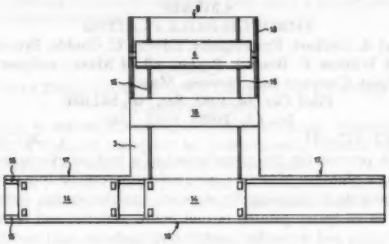
4,515,831
COATING RECOVERABLE SHEETS

Marc Wille, Baal, Belgium, assignor to N. V. Raychem S. A., Belgium

Filed Oct. 19, 1982, Ser. No. 435,158
Claims priority, application United Kingdom, Oct. 23, 1981, 8130259
Int. Cl.³ B05D *3/08, 3/02, 1/28;* C23C *13/08*
U.S. Cl. 427—223 **30 Claims**

1. A method of sealant-coating heat-recoverable polymer sheet, comprising heating the heat-recoverable polymer sheet

to an elevated temperature, and subsequently applying a solid sheet of heat-activatable sealant to the heated polymer sheet



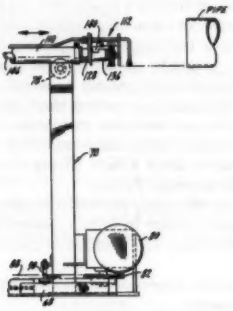
while the polymer sheet is at a temperature capable of activating the sealant so as to adhere it to the polymer sheet.

4,515,832

METHOD FOR COATING THE INSIDE OF PIPE

Charles L. Roeder, Glendale; William J. Siefert, Waukesha, and Frederik Theijsmeijer, Racine, all of Wis., assignors to Rexnord, Inc., Milwaukee, Wis.

Filed Jun. 24, 1977, Ser. No. 809,570
Int. Cl.³ B05D *7/22*
U.S. Cl. 427—233 **3 Claims**



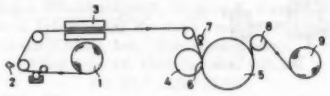
1. A method of coating the inside of a pipe to increase its resistance to wear, including the steps of providing a coating material including a matrix composed of a cross-linkable thermo-setting resin, a curing agent for the resin, and abrasion-resistant particles in the form of chips, disposing the pipe about a generally horizontal axis, supplying the matrix and the chip-like particles to the inside of the pipe, intermixing the matrix and chiplike particles inside of the pipe and applying the mixture to the inner surface of the pipe, rotating the pipe about a generally horizontal axis, and relating the speed of rotation of the pipe, and the fluidity of the mixture such that the centrifugal force applied to the matrix and particles will cause at least a substantial proportion of the chips to be oriented in the matrix, as it cures, in a nonradial direction so that when the matrix is fully cured, the maximum area of the chips will be exposed to the abrasive material flowing through the pipe in use.

4,515,833

METHOD OF PRODUCING CAST COATED PAPER AND PRODUCT THEREOF

Kazuhiro Nojima; Hiroyuki Fujimoto, and Mikio Takahashi, all of Amagasaki, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,336
Claims priority, application Japan, May 18, 1983, 58-88212
Int. Cl.³ B05D *3/12*
U.S. Cl. 427—362 **8 Claims**



1. A method of increasing the rate of production of cast coated paper which comprises applying to a web of base paper an aqueous coating composition, the pigment component of which contains 30% to 80% by weight of cubic calcium carbonate having a mean particle size of 0.1 to 1.0 microns, and finishing the surface of the coating layer by bringing it into contact with a finishing surface of a cast coating drum at a temperature above 90° C., said cast coated paper having a gloss of above 88%.

4,515,834

RTV POLYORGANOSILOXANE COMPOSITIONS YIELDING PAINTABLE ELASTOMERS

Miyoji Fukayama, and Chikara Ichijo, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Division of Ser. No. 560,705, Dec. 12, 1983,. This application Aug. 13, 1984, Ser. No. 639,565
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—387 **7 Claims**

1. A method for preparing a painted, cured silicone elastomer, said method comprising the steps of

I. mixing under conditions which exclude moisture

(A) 100 parts by weight of a hydroxyl-terminated polyorganosiloxane exhibiting a viscosity of from 0.02 to 1,000 Pa·s at 25° C.;

(B) from 0.5 to 30 parts by weight of at least one organosilicon compound containing at least two silicon-bonded groups per molecule selected from the group consisting of amide, aminoxy and combinations thereof; and

(C) from 0.05 to 15 parts by weight of a dialkoxysilane of the general formula $X'R^1SiR^2(OR^3)_2$ or a partial hydrolysis condensation product thereof, where X' represents an amino, $(CH_3CH_2)_2N$—, $H_2NCH_2CH_2(H)N$—, mercapto, acryloxy, methacryloxy, or epoxy group, R^1 represents an alkylene, haloalkylene or oxyalkylene radical, and R^2 and R^3 are individually selected from the group consisting of monovalent hydrocarbon radicals, monovalent alkoxyhydrocarbon radicals, and monovalent halohydrocarbon radicals;

II exposing the resultant composition to room temperature and atmospheric moisture for a sufficient time to form a cured silicone elastomer; and

III. applying a paint to the surface of said cured silicone elastomer.

4,515,835

HIGH SOLIDS THERMOSETTING COATING COMPOSITIONS, CURED COATINGS, COATED ARTICLES, AND PROCESSES

Robert R. Kuhn, Lansdale; John D. Whiteman, Churchville, and William H. Brendley, Jr., Hatboro, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 23, 1982, Ser. No. 452,546
Int. Cl.³ B05D 7/16; C08L 61/28
U.S. Cl. 427—388.3 33 Claims

1. High solids, thermosetting coating composition comprising a soft, low molecular weight, hydroxy-functional addition polymer resin having a GPC $\overline{M}_w$ of less than about 20,000, having a glass transition temperature (Tg) of below about 25° C., a low molecular weight polyether reactive diluent having (a) two or three aliphatic hydroxyl groups per molecule, (b) the property of remaining essentially nonvolatile under curing conditions to minimize emissions, and (c) a molecular weight of about 250 to 1000, the weight ratio of resin to diluent being greater than 1, and an inert organic solvent for said resin and said diluent, said coating composition, when combined with aminoplast crosslinking agent, being of sprayable, roller coatable, or dip coatable viscosity.

4,515,836

PROCESS FOR COATING SUBSTRATES WITH AQUEOUS POLYMER DISPERSIONS

Walter H. Cobbs, Jr., Amherst, and William R. Rehman, Vermillion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 399,047, Jul. 16, 1982, abandoned. This application Jun. 3, 1983, Ser. No. 500,877
Int. Cl.³ B05D 1/02
U.S. Cl. 427—425 28 Claims

1. A process for coating a substrate with a uniform polymeric coating comprising

providing a substrate having a surface to be coated,

impacting said surface with a stream of a stabilized dispersion of polymer in water,

initially forming on said surface a gel coating layer bonded to said surface and caused by destabilization of said dispersion upon said impact,

thereafter continuing to expose the gelled coating layer to said stream of stabilized polymer dispersion to produce a wet integral coating including a covering layer of polymer dispersion completely covering said gel layer, said gel layer serving as an interfacial layer to adhere said covering layer of polymer dispersion to said substrate,

heating said wet integral coating to form a substantially completely gelled coating throughout its thickness on said surface, and

further heating said gelled coating to coalesce said polymer into a substantially uniform coating on said substrate.

4,515,837

RIBBON FOR FORMING A DECORATIVE BOW

Peter S. C. Cheng, 32 Wyndham St., Flat 10-C, Hong Kong, Hong Kong

Filed Feb. 29, 1984, Ser. No. 584,630
Int. Cl.³ D04D 7/10
U.S. Cl. 428—4 9 Claims

1. A bow-forming ribbon comprising at least one longitudinally-extending decorative flexible ribbon member, a series of relatively stiff retainer members spaced apart at intervals along the length of the ribbon member and each being restrained against movement relative to the ribbon member and defining an aperture extending generally transversely across the ribbon member at an angle with respect to the transverse direction, each retainer member being located relative to the ribbon member by locating means disposing the retainer member at an angle with respect to the transverse direction different from that of the adjacent preceding retainer member, and at least one drawstring member running freely through the apertures defined by the successive retainer members.

4,515,838

FANCY ARTICLE FOR USE AS A GREETING GIFT SUCH AS A GREETING CARD

Yukio Miyajima, 23, Aza-Chohai, Oaza-Nagakute, Nagakute-cho, Aichi-gun, Aichi-ken, Japan

Filed Jan. 12, 1984, Ser. No. 570,243
Int. Cl.³ B32B 3/04; G09F 1/12
U.S. Cl. 428—14 17 Claims

1. A fancy article for use as a greeting gift such as a greeting card, comprising:

a metal sheet having on a flat front surface thereof an imprint of an image including at least one of pictures, designs and other visible representations, said imprint being printed in plural colors, said metal sheet including a peripheral rib formed along the entire periphery thereof and protruding from a back surface thereof in a direction away from said

front surface, said peripheral rib cooperating with said back surface to define a receptacle of a small depth;

a filler occupying a substantive volume of said receptacle and having a rear surface which protrudes away from an edge of said peripheral rib in said direction; and

a planar writing medium provided on said rear surface of said filler and made of a material suitable for writing thereon.

4,515,839

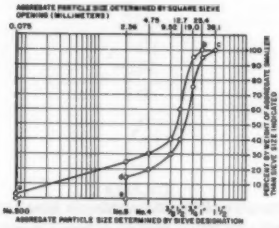
PERMEABLE ASPHALTIC CONCRETE BASE FOR ARTIFICIAL TURF

Wayne R. Broaddus; Khalil N. Jaber, and Thomas A. Orofino, all of Whitfield County, Ga., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 31, 1983, Ser. No. 546,801

Int. Cl.³ B32B *3/02, 33/00*

U.S. Cl. 428—17 **10 Claims**



5. A playing field comprising a layer of permeable artificial turf and a base comprising an asphaltic concrete composition having a permeability sufficient to accommodate at least 40 centimeters per hour of rainfall at 25 mm of thickness of concrete comprising asphaltic cement, anti-stripping agent, and a gradated mixture of bulky aggregate rock having a size gradation such that the percentage by weight of the mixture passing through a sieve having square openings of

(a) 38.1 millimeters is 100 percent,

(b) 25.4 millimeters is 95–100 percent,

(c) 19.0 millimeters is 75–95 percent,

(d) 12.7 millimeters is 40–60 percent,

(e) 9.52 millimeters is 30–40 percent,

(f) 4.75 millimeters is 20–30 percent,

(g) 2.36 millimeters is 15–25 percent, and

(h) 0.075 millimeters is 0–3 percent.

4,515,840

SHEET MATERIAL

Douglas K. Gatward, 1212 Great Cambridge Rd., Enfield, Middlesex, England

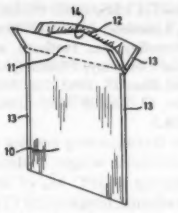
Filed Feb. 23, 1982, Ser. No. 351,543

Claims priority, application United Kingdom, Feb. 23, 1981, 8105649

Int. Cl.³ B32B *27/10;* **B65D** *65/02*

U.S. Cl. 428—35 **11 Claims**

1. A laminate wrapping material comprising a sheet of smooth, calendared on at least one side, machine-glazed kraft or sulphite paper in the order of 15 to 35 grams per square meter, and a coextensive sheet of thermoplastic film in the order of 8 to 35 microns in thickness discontinuously attached to each other at regular or irregular intervals along lines of bonding such as to define between the sheets a plurality of channels or pockets on the order of 1 to 5 millimeters in width in the plane of the laminate isolated from one another by said lines of bonding, said paper sheet embodying deadfold characteristics of such magnitude as to impart deadfold characteristics to the composite laminate and said thermoplastic film containing microperforation of such magnitude as to permit transmission of water vapor and hot air through the laminate and to constitute a barrier to the transmission of grease through the laminate and wherein at least some of the microperforations perforate the thermoplastic film into the channels or pockets.



4,515,841

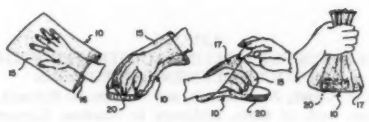
PORE FORMING STERILIZATION BAG

Denis G. Dyke, Edinboro, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Dec. 30, 1983, Ser. No. 567,234

Int. Cl.³ B32B *1/02*

U.S. Cl. 428—35 **10 Claims**



1. A receptacle for handling contaminated waste for steam sterilization and subsequent disposal comprising:

a bag formed from an air and water impervious thermoplastic film, said film having means embedded therein to form pores therethrough upon exposure to steam sterilization.

4,515,842

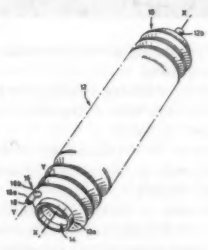
BLOW MOLDED ARTICLE

Steve A. Kovacs, Weston, Canada, assignor to Supreme Casting & Tooling, Rexdale, Canada

Division of Ser. No. 259,320, Apr. 30, 1981, Pat. No. 4,396,574. This application Sep. 29, 1982, Ser. No. 427,030

Int. Cl.³ B32B *3/26, 3/28*

U.S. Cl. 428—36 **2 Claims**



1. A blow molded plastic article having a body portion of corrugated form which is molded in one piece and which defines: an internal space; a main opening at a first end of said portion communicating with said space and extending about a first axis; a passageway defining a secondary opening adjacent said main opening; and a further opening at a second end of said body portion opposite said first end; said passageway

including an outer portion which extends about a second axis spaced from and generally parallel to said first axis, and an inner portion which is inclined inwardly towards said first axis and communicates with said internal space, said article being formed by blow molding in a single operation.

4,515,843

DISC-SHAPED INFORMATION CARRIER HAVING A HIGH STORAGE DENSITY

Heinz Borchard, Nortorf; Herbert Knothe, Neumünster, and Bruno Rybka, Nortorf, all of Fed. Rep. of Germany, assignors to Teldec Telefunken-Decca Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,480

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818490

Int. Cl.³ B29D *17/00;* **B32B** *3/02;* **G06K** *19/02;* **G11B** *23/00*

U.S. Cl. 428—64 **5 Claims**

1. A rigid disc-shaped information carrier produced by thermoplastic deformation comprising a pressed mass including a co-polymer of vinyl chloride having additives incorporated therein, said additives comprising a stabilizer system comprised of amino crotonic ester, calcium stearate, and carbon black and a lubricant system comprised of partial esters of glycerin in combination with amino fatty acid esters with epoxide groups, a rigid disc information carrier being thereby produced having hygroscopic properties and relief-like surface portions which are sufficiently yielding to permit pressure scanning.

4,515,844

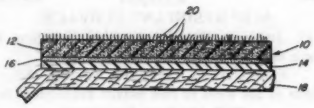
DELSOLITE

Thomas E. Coughlin, Tyngsboro, Mass., assignor to Nylco Corporation, Nashua, N.H.

Filed Mar. 19, 1984, Ser. No. 590,960

Int. Cl.³ B32B *3/02, 5/06, 5/22*

U.S. Cl. 428—82 **17 Claims**



1. A footwear insulating composition which comprises:
a polyurethane membrane;
a layer of polyurethane foam adhesively engaged thereto;
a plurality of fibers secured to the membrane extending through and beyond the foam to form a napped surface, the composition having a moisture vapor transmission factor of from 0.35 to 0.60 and a thermal insulation factor of from R15 to R22.

4,515,845

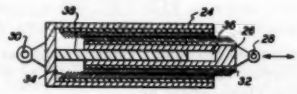
PILE DAMPER MECHANISM

Gerald A. Annis, Pittsford, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed May 16, 1983, Ser. No. 494,783

Int. Cl.³ D03D *27/00*

U.S. Cl. 428—86 **18 Claims**



1. A damper comprising first and second relatively movable rigid members having first and second spaced-apart opposing surfaces, means for limiting the relative movement of said members to lateral movement parallel to said surfaces; first and second pile layers on said first and second surfaces, respectively, the fibers of said pile layers at least partially interlocking or overlapping for damping relative movement between said elements.

4,515,846

POLYURETHANE BACKED CARPET FORMED WITH TWO CATALYSTS

Linda M. McKinney, and Osborne K. McKinney, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 9, 1984, Ser. No. 598,106

Int. Cl.³ B32B *3/02, 33/00*

U.S. Cl. 428—95 **10 Claims**

1. In a synthetic primary backed carpet substrate backed with, as a secondary backing, a urethane composition prepared from a composition comprising one or more polyols, one or more polyisocyanates, one or more catalysts and optionally one or more fillers and/or thermoplastic polymers; the improvement which comprises employing as the catalyst therefor a combination consisting of (1) at least one delayed action, heat activated catalyst which exhibits a tack-free time of not greater than about 8 minutes and (2) at least one conventional catalyst which exhibits a tack-free time of greater than about 8 minutes and which provides a viscosity for a mixture of the catalysts, polyol, isocyanate and filler and/or thermoplastic polymer, if present, of less than about 20000 cps in 5 to 6 minutes at 37°–42° C. so as to provide an improvement in at least one of the properties selected from tack-free time, edge curl and tuft lock.

4,515,847

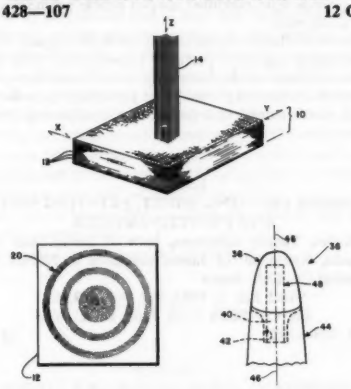
EROSION-RESISTANT NOSETIP CONSTRUCTION

Arthur R. Taverna, Lexington, and Warren S. Thompson, Stoneham, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 22, 1984, Ser. No. 643,140

Int. Cl.³ B32B *1/00, 1/10;* **B64G** *1/00, 1/22*

U.S. Cl. 428—107 **12 Claims**



1. In a process for fabricating a reentry carbon-carbon nosetip structure comprising the steps of:
(a) stacking a plurality of layers of X-Y woven fabric;
(b) piercing said stack of layers of woven fabric in the Z direction with a plurality of rigidized carbon rods to form a preform;
(c) impregnating said preform with a material convertable to carbon by heat treatment;
(d) carbonizing the impregnated preform;
(e) graphitizing the carbonized preform;
(f) repeating steps (c) through (e) to achieve a desired bulk density; and
(g) machining the resulting densified composite structure to a desired configuration;
the improvement comprising selectively loading the said layers of woven fabric with a heat-resisting particulate material to provide a desired ablative performance in said nosetip structure.

8. A mutually orthogonal three-directional reinforcement

structure for a composite material which comprises a plurality of layers of X-Y woven fabric pierced by a plurality of rigid carbon rods in the Z direction, wherein at least a portion of the said fabric layers is loaded with a heat-resisting particulate material.

4,515,848

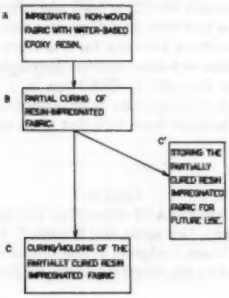
MATERIALS AND METHODS FOR MAKING RESIN-RIGIDIFIED ARTICLES

Carl V. Lesnig, Glenmont, N.Y., and Robert F. Kovar, Wrentham, Mass., assignors to Gates Formed Fibre Products Inc., Auburn, Me.

Filed Sep. 23, 1983, Ser. No. 535,320

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—172 **18 Claims**


A
IMPREGNATING NON-WOVEN FABRIC WITH WATER-BASED EPOXY RESIN.
B
PARTIAL CURING OF RESIN-IMPREGNATED FABRIC.
C'
STORING THE PARTIALLY CURED RESIN IMPREGNATED FABRIC FOR FUTURE USE.
C
CURING/MOLDING OF THE PARTIALLY CURED RESIN IMPREGNATED FABRIC

4. A porous resin-rigidified shaped article permeable to gas, which comprises:

a non-woven fabric comprised of synthetic organic filaments entangled together, partially impregnated with a cured thermoplastic or thermosetting water-based epoxy resin to impart the desired porosity and permeability to the article, and mold formed in a desired shape retaining configuration.

4,515,849

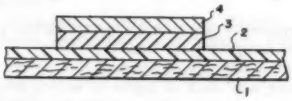
TRANSFER PRINTING SHEET, PRINTING METHOD AND PRINTED ARTICLE

Goro Keino; Yosuke Kitagawa, both of Ohtsu, and Yoshimi Hayashi, Kyoto, all of Japan, assignors to Matsui Shikiso Chemical Co. Ltd., Japan

Filed Jun. 1, 1983, Ser. No. 499,911

Int. Cl.³ B32B *3/10, 7/06;* B44C *1/16*

U.S. Cl. 428—201 **12 Claims**



1. Transfer printing sheet for transferring a pattern onto an article of synthetic fibers, comprising a base sheet having a coatable surface, a releasing resin layer at least partially coating the coatable surface of the base sheet, a pattern in the form of a pattern layer printed on the releasing resin layer and comprising an elastic high polymer resin and a pigment in admixture, and a dissolving agent layer containing an agent of monomeric organic compound constitution or of inorganic compound constitution for dissolving adjacent surface portions of synthetic fibers of an article onto which the pattern is to be transferred, the dissolving agent layer covering the entire surface of the pattern layer, whereby the pattern of the pattern layer can be transferred onto the article of synthetic fiber when the sheet is subjected to heat and printing pressure with the dissolving agent layer in contact with the article.

4,515,850

COMPOSITE FERRITE TEXTILE

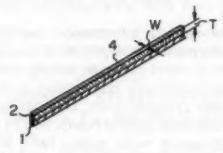
Ken Ishino; Yasuo Hashimoto; Kenichi Ichihara, and Yoshikazu Narumiya, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 529,992

Claims priority, application Japan, Sep. 13, 1982, 57-158218; Nov. 24, 1982, 57-204616

Int. Cl.³ D03D *3/00*

U.S. Cl. 428—225 **20 Claims**



1. A composite ferrite cloth woven from textile, said textile including a composite ferrite textile containing composite ferrite, said composite ferrite comprising a mixture of a ferrite powder and a binder, said binder bonding said ferrite powder together to form said composite ferrite, wherein the volume ratio of ferrite powder to said mixture in said composite ferrite is in the range between 0.2 and 0.8.

4,515,851

SLIP RESISTANT SURFACES

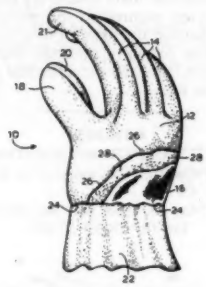
Michael D. Johnson, Coshocton, Ohio, assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Oct. 25, 1982, Ser. No. 436,253

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—246 **6 Claims**



1. A laminate for providing a garment having an exposed slip resistant gripping surface for use in a grease, oil or water work environment, characterized by

(a) a substrate, said substrate being a member selected from the group consisting of a non-woven fibrous web, a woven web, and a knitting web;

(b) a foamed layer applied to one surface of said substrate;

(c) said foamed layer forming the outer gripping surface for a garment made from such laminate; and

(d) said foamed layer having an air content within the range of between about 10 to 65 percent.

4,515,852

LEATHER-LIKE SHEET MATERIAL HAVING LOW SLIP CHARACTERISTICS

Kenichi Katabe, Wakayama, and Takeo Nishimura, Okayama, both of Japan, assignors to Kuraray Co., Ltd., Okayama and Kao Soap Co., Ltd., Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,451
Claims priority, application Japan, May 10, 1982, 57-78877
Int. Cl.³ B32B 7/00, 15/00; D03D 3/00
U.S. Cl. 428—246 8 Claims

1. A leather-like sheet material having low slip characteristics comprising:

sheet material having a fibrous substrate consisting of a fibrous mat,

a surface layer consisting of a polymer mainly composed of a polyurethane elastomer, and

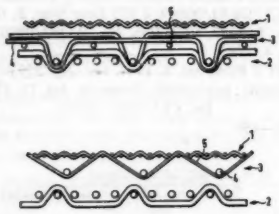
an acryl-modified polyurethane resin spread on the surface layer, said acryl-modified polyurethane resin spread on the surface layer, said acryl-modified polyurethane resin being made by polymerization of an ethylenically unsaturated compound in the presence of a polyurethane emulsion.

4,515,853

COMPOSITE FABRIC FOR USE AS CLOTHING FOR THE SHEET FORMING SECTION OF A PAPERMAKING MACHINE

Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co. KG, Reutlinger, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 571,817
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301810
Int. Cl.³ D03D 11/00, 13/00; D21F 7/08
U.S. Cl. 428—257 9 Claims



1. A composite fabric for use as clothing for the sheet forming section of a papermaking machine, said fabric comprising at least two fabric layers interconnected by binder threads and being characterized in that part of the binder threads extend in the warp direction and part of said threads extend in the weft direction and said threads form an elastic interlayer, and in that each binder thread is woven into not more than one of the at least two fabric layers.

4,515,854

ENTANGLED FIBROUS MAT HAVING GOOD ELASTICITY AND METHODS FOR THE PRODUCTION THEREOF

Kunio Kogame; Yoshihiro Tanba, and Masaru Makimura, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 30, 1984, Ser. No. 605,642
Claims priority, application Japan, May 13, 1983, 58-84481; May 13, 1983, 58-84482
Int. Cl.³ D04H 1/58
U.S. Cl. 428—288 13 Claims

1. An entangled fibrous mat comprising a fiber A consisting essentially of an elastic polymer and a fiber B consisting essentially of a nonelastic polymer, said fiber A formed by removing, after entanglement with fiber B, nonelastic polymer from a fiber comprising a nonelastic polymer and an elastic polymer,

thereby forming axially extending long voids therein, said fiber A being in a taut condition within the mat and said fiber B being in a slack condition.

4,515,855

PROCESS FOR SIZING TEXTILE MATERIALS

Chi-Fei Ling, Edison, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 268,924, Jun. 1, 1981, abandoned. This application Mar. 11, 1983, Ser. No. 474,627
Int. Cl.³ B32B 27/00; B05D 3/02
U.S. Cl. 428—290 9 Claims

1. A process for sizing a textile substrate material comprising applying to the textile material a composition comprising an aqueous solution of at least 3% by weight solids content of a copolymer of acrylamide and at least one hydrophobic vinyl, or vinylidene, polymerizable monomer, the amount of the polymerizable monomer in the composition being at a concentration from about 1% to 40%, based on the weight of acrylamide in the composition, and thereafter drying the treated substrate, the composition being applied in an amount and the drying being at a temperature, respectively, sufficiently high to impart a high order of abrasion resistance to the textile material, the composition being capable of being removed from said textile substrate material by aqueous washing.

4. The process according to claim 1 wherein the textile material is a cotton yarn.

9. The treated textile material of claim 4.

4,515,856

MAGNETIC RECORDING MEDIA COMPRISING TITANIUM MONOXIDE AND CARBON BLACK POWDERS IN A MAGNETIC RECORDING LAYER

Ikuo Matsumoto, Mito, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Aug. 8, 1983, Ser. No. 521,173
Claims priority, application Japan, Aug. 9, 1982, 57-137335
Int. Cl.³ B32B 5/16
U.S. Cl. 428—323 6 Claims

1. A magnetic recording medium comprising a support, and a magnetic recording layer formed on at least one side of said support, said magnetic recording layer comprising a dispersion of magnetic particles, and a mixture of about 0.1 to 20 weight percent of a titanium monoxide powder and about 1 to 10 weight percent of a carbon black powder, both based on said magnetic particles, in a resin binder, wherein the titanium monoxide and carbon black powders have average particle sizes of from 0.01 to 5 microns and from 13 to 50 millimicrons, respectively.

4,515,857

MAGNETIC RECORDING MEDIUM

Tatsuji Kitamoto, and Goro Akashi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed May 6, 1982, Ser. No. 375,690
Claims priority, application Japan, May 7, 1981, 56-67640
Int. Cl.[3] G11B 5/70; B32B 5/30
U.S. Cl. 428—328 11 Claims

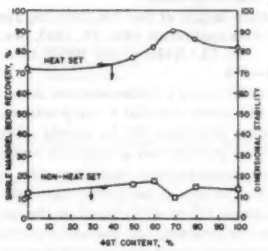
1. A magnetic recording medium having a high signal-to-noise ratio in high density recording and a low noise level in short wavelength recording and comprising a non-magnetic support and a magnetic recording layer coated directly thereon, the magnetic recording layer comprising ferromagnetic particles dispersed in a non-magnetic binder, wherein the ferromagnetic particles are cubic particles of at most 0.3 micron and are subjected to a magnetic orientation treatment in the vertical direction to the recording surface.

4,515,858

POLYESTER HAIRBRUSH BRISTLE

Ghawamedin Bayan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 28, 1983, Ser. No. 555,496
Int. Cl.[3] D02G 3/00
U.S. Cl. 428—364 2 Claims



1. A monofilament suitable for use as a brush bristle having a diameter of about 5–10 mils and being oriented about 3.0–5.0 times in a longitudinal direction, the polymeric components of the monofilament consisting essentially of, complementally, about 65–75 weight percent polybutylene terephthalate and about 35–25 weight percent polyethylene terephthalate, and wherein the monofilament exhibits a Mandrel Bend Recovery after ten cycles of at least about 80%.

4,515,859

HYDROPHILIC, WATER-ABSORBING ACRYLONITRILE POLYMER FIBER

Francesco De Maria, Gulf Breeze, Fla., and William E. Streetman, Cincinnati, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 16, 1982, Ser. No. 418,863
Int. Cl.[3] D02G 3/00; D01F 6/18
U.S. Cl. 428—398 8 Claims

1. A melt-spun, hydrophilic, moisture-absorbing acrylonitrile polymer fiber structured from an acrylonitrile copolymer comprising from about 85 to 89 weight percent of acrylonitrile, from about 1 to 3 weight percent of one or more comonomers which provide hydrophilic moieties and the balance of one or more hydrophobic comonomers, said polymer having a number average molecular weight in the range of about 6000 to 14,750, the fiber structure having a continuous water-hiding cavity extending throughout the entire fiber length and constituting between about 10% and 40% of the corresponding fiber free of said cavity, said cavity being open, and said fiber being characterized by a filament denier of about 0.75 to 2.0, a dye intensity of at least about 45%, a shade change due to hot-wet processing of less than about 15, a moisture absorption of at least about 12%, a straight tenacity of at least about 2.5 grams per denier and a wicking index of at least about 100, said fiber exhibiting a comfortable feel to the wearer when formed into a garment.

4,515,860

SELF PROTECTING CARBON BODIES AND METHOD FOR MAKING SAME

Robert A. Holzl, La Canada, Calif., assignor to Dart Industries Inc., Northbrook, Ill.

Filed Sep. 10, 1982, Ser. No. 416,628
Int. Cl.[3] C23C 11/00, 11/08; B32B 9/00
U.S. Cl. 428—408 9 Claims

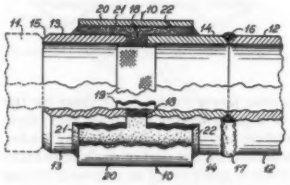
1. A coated article comprising a body of carbon material in monolithic or composite form upon which has been thermochemically deposited a silicon alloy coating comprising one or more alloying elements selected from the group consisting of carbon, oxygen, aluminum and nitrogen in the form silicon carbide, silicon nitride, silicon oxynitride, or sialon, said coating having a non-columnar grain distribution with substantially equiaxial grains of an average diameter of less than one micron and forming a correspondingly fine crack mosaic upon stressing due to differences in thermal coefficients of expansion between said coating and said body, and wherein the amount of silicon is in excess of stoichiometry to an extent sufficient to confer crack healing characteristics at temperatures of the order of the melting point of silicon.

4,515,861

ARTICLES PROTECTED AGAINST CORROSION AND METHODS FOR PROTECTING ARTICLES AGAINST CORROSION

Hans Arup, Lyngby, Denmark, assignor to Aktieselskabet Aalborg Portland-Cement-Fabrik, Aalborg, Denmark

PCT No. PCT/DK81/00069, § 371 Date Mar. 5, 1982, § 102(e) Date Mar. 5, 1982, PCT Pub. No. WO82/00302, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 8, 1981, Ser. No. 359,658
Claims priority, application Denmark, Jul. 11, 1980, 3030/80
Int. Cl.[3] C23F 15/00
U.S. Cl. 428—450 6 Claims



1. A method of protecting a steel article against corrosion by being completely or partially coating it with a material showing resistivity of at least about 0.1 MΩcm and comprising a coherent binder matrix which comprises:

(A) homogeneously arranged inorganic solid particles of a size of from about 50 Å to about 0.5 μm, or a coherent structure formed from such homogeneously arranged particles, and

(B) densely packed solid particles having a size of the order of about 0.5–100 μm and being at least one order of magnitude larger than the respective particles stated under (A), or a coherent structure formed from such densely packed particles; the particles A or the coherent structure formed therefrom being homogeneously distributed in the void volume between the particles B, the dense packing being substantially a packing corresponding to the one obtainable by gentle mechanical influence on a system of geo-

metrically equally shaped large particles in which locking surface forces do not have any significant effect;

the particles A being substantially densely packed in the voids between densely packed particles B and being present in a volume of 5–50% by volume, calculated on the combined volume of the particles A+B; the particles B comprising Portland cement particles conferring corrosion protection to the steel due to the alkaline nature of the hardened Portland cement.

4,515,862

COATED SURFACES CAPABLE OF DECOMPOSING OILS

Masao Maki, Nabari; Yasunori Kaneko, Ikoma, and Ikuo Kobayashi, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 480,380, Apr. 5, 1983, Pat. No. 4,471,027, which is a continuation of Ser. No. 263,177, May 13, 1981, abandoned, which is a continuation of Ser. No. 85,059, Oct. 12, 1979, abandoned. This application Mar. 5, 1984, Ser. No. 586,144

Claims priority, application Japan, Oct. 16, 1978, 53-127543; Feb. 13, 1979, 54-15743; Jul. 26, 1979, 54-95381

The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.

Int. Cl.³ B32B *9/06, 15/04*

U.S. Cl. 428—450 **4 Claims**

1. A coated metal substrate of aluminum having a surface capable of decomposing oils at about 200° to 300° C. through a gasification cracking reaction, said surface being produced by a process consisting essentially of applying a paint to said metal substrate and sintering said paint, said paint including a catalyst consisting of at least one or more oxides selected from the group consisting of:

(A) oxides of Group 1A or 2A of the Periodic Table, and

(B) compounds represented by the formula $(MA)_x(MB)_y(O)_z$

where

MA: element of Group 1A or 2A

MB: element of Group 3A or 4A

O: oxygen

x, y, z: interger said catalyst being the sole effective catalyst for decomposing oils and being present in an amount sufficient to effect such decomposition and an inorganic binder, a hardening agent, and a pigment.

4,515,863

POLYESTER FILM PRIMED WITH PHOSPHORUS-CONTAINING POLYESTER

R. Scott Caines, Greer, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Mar. 16, 1984, Ser. No. 590,399

Int. Cl.³ B32B *27/06, 27/36*

U.S. Cl. 428—480 **22 Claims**

1. An oriented self-supporting polyester film having a thin continuous primer coating having a thickness within the range of about 0.0098 to 0.059 grams per square meter on one or both sides thereof, said coating comprising a second polyester comprising the condensation product of:

(a) a dicarboxylic reactant consisting of isophthalic acid, the corresponding ester, acyl halide, and mixtures thereof or said dicarboxylic reactant in optional admixture with up to equal parts on a molar basis of (1) at least one aliphatic dicarboxylic acid, a corresponding acid anhydride, ester and acyl halide or mixtures thereof, (2) at least one other aromatic dicarboxylic acid, a corresponding acid anhydride, ester and acyl halide, or (3) mixtures of (1) and (2),

(b) at least one diol or polyoxyalkylene glycol, and

(c) a phosphorus acid reactant, wherein said second polyester is solid, branched, and contains repeating carbonyl-oxy units and phosphate units wherein each of said units is an integral part of said polyester primer coating chain.

4,515,864

SOLID METAL ARTICLES FROM BUILT UP SPLAT PARTICLES

Alfred R. E. Singer, Swansea, Wales, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom, London, England

Division of Ser. No. 92,956, Nov. 9, 1979, abandoned, which is a continuation of Ser. No. 921,761, Jul. 3, 1978, abandoned, which is a continuation of Ser. No. 754,844, Dec. 27, 1976, abandoned, which is a continuation of Ser. No. 589,599, Jun. 23, 1975, abandoned. This application Jul. 30, 1982, Ser. No. 403,413

Claims priority, application United Kingdom, Jun. 28, 1974, 28769/74

Int. Cl.³ B22F *3/06*

U.S. Cl. 428—546 **3 Claims**

1. A solid metal article consisting of a plurality of splat particles built up one upon another by a spray deposition process, said article being in the physical condition as deposited by the said process, such that

(i) the article as cast is substantially free from porosity;

(ii) the microstructure of the article exhibits crystal growth across the original splat particle boundaries;

(iii) the microstructure of the article exhibits a minimum of segregation of constituent materials; and

(iv) any oxides and other impurities present are distributed within the article, such that they are not concentrated at the boundaries of the constituent splat particles or crystal grains.

4,515,865

CORROSION-RESISTANT COATED FERROUS BODY

Dong-Sil Park, and Robert J. Zabala, both of Schenectady, N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 24, 1983, Ser. No. 525,780

Int. Cl.³ H01M *10/39;* **B32B** *15/18*

U.S. Cl. 428—610 **4 Claims**

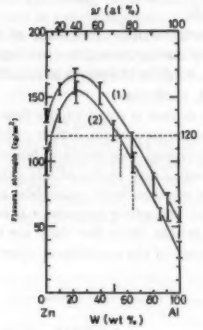
1. A coated ferrous metal body consisting essentially of a ferrous metal body having a diffusion bonded coating, said coated body being significantly resistant to corrosion and free of any significant polarization, said coated body being useful as a component in a sodium sulfur cell wherein said coating is in contact with said sulfur, the bulk of said coating consisting essentially of an alloy ranging from about 70% by weight to about 98% by weight molybdenum, up to about 5% by weight iron balance of at least about 1% by weight chromium, the outside surface of said coating or outside surface portion extending from said bulk portion consisting essentially of an alloy ranging from about 30% by weight to about 80% by weight chromium, up to about 1% by weight iron balance molybdenum, said outside surface or outside surface or outside surface portion being significantly richer in chromium than said bulk portion and containing sufficient chromium to make said coated body free of any significant polarization, and a diffusion bonding layer extending from said bulk portion into the ferrous metal body consisting essentially of MoCrFe alloy containing at least about 10% by weight molybdenum, at least about 5% by weight chromium and at least about 10% by weight iron.

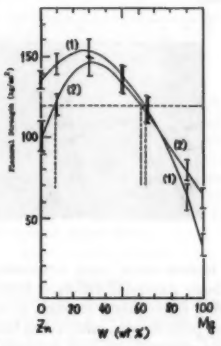
4,515,866

FIBER-REINFORCED METALLIC COMPOSITE MATERIAL

Hideho Okamoto; Kohji Yamatsuta, both of Otsu, and Ken-ichi Nishio, Shiga, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 364,515, Mar. 31, 1982, abandoned. This application May 6, 1983, Ser. No. 492,048
Claims priority, application Japan, Mar. 31, 1981, 56-49019
Int. Cl.³ C22C *1/09, 21/00*
U.S. Cl. 428—614 **9 Claims**





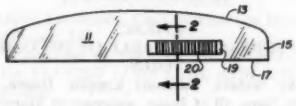
1. A fiber-reinforced metal composite material consisting essentially of a reinforcing material and matrix, said reinforcing material being an inorganic fiber containing at least two components selected from the group consisting of carbon, metal oxides, metal carbides, metal nitrides and metal borides, and said matrix being metal alloys comprising not less than 10% by weight of zinc and not more than 90% by weight of one element selected from the group consisting of aluminum and magnesium, provided that a metal alloy containing 94 to 96% by weight of zinc and 4 to 6% by weight of aluminum, a metal alloy containing 77 to 79% by weight of zinc and 21 to 23% by weight of aluminum, and a metal alloy containing 59 to 61% by weight of zinc and 39 to 41% by weight of aluminum are excluded.

4,515,867

METHOD FOR ABLATING A CODED MARKING INTO A GLASS WORKPIECE AND PRODUCT THEREOF

John N. Bleacher, Lititz, and Barry M. Cushman, Lancaster, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 20, 1982, Ser. No. 420,495
Int. Cl.³ B32B *3/10, 5/16, 7/00, 19/04*
U.S. Cl. 428—204 **10 Claims**



1. In a method for producing a machine-readable coded marking in a surface of a glass workpiece, said method including

(a) coating a selected surface area of said glass workpiece with an undercoating comprising a first aqueous suspension of first pigment particles and a first alkali silicate binder,

(b) drying said undercoating,

(c) coating said dry undercoating with an overcoating comprising a second aqueous suspension of second pigment particles and a second alkali silicate binder,

(d) drying said overcoating, and

(e) recessing a plurality of related marks through said overcoating by selectively ablating said overcoating with a laser beam,

the improvement wherein said first suspension includes an operative proportion of mica particles, said proportion of mica being operative to reduce the tendency to spalling of said glass workpiece by said laser beam, and said second suspension is essentially free from mica particles.

4,515,868

HOMOGENEOUS, DUCTILE COBALT BASED HARDFACING FOILS

Debasis Bose, Randolph; Amitava Datta, Mendham; Nicholas J. DeChristofaro, Chatham, all of N.J., and Claude Henschel, Redwood City, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 285,882, Jul. 22, 1981, abandoned. This application Jul. 21, 1983, Ser. No. 515,679
Int. Cl.³ B32B *15/01;* **C22C** *19/07*
U.S. Cl. 428—656 **1 Claim**

1. A hardfaced metal article, said article having been hardfaced with a homogeneous, ductile hardfacing foil composed of metastable material having at least 50 percent glassy structure and a composition consisting essentially of 0 to about 30.9 atom percent nickel, 0 to about 7.3 atom percent iron, 0 to about 26.3 atom percent chromium, 0 to about 1.3 atom percent tungsten, 0 to about 4 atom percent molybdenum, about 8 to about 13 atom percent boron, 1.7 to about 13 atom percent silicon, 0 to about 1.3 atom percent manganese, 0 to 4.5 atom percent carbon, and 39.4 to 70.3 atom percent cobalt plus incidental impurities with the proviso that the total of iron, cobalt, nickel, chromium, tungsten and molybdenum ranges from about 70 to 88 atom percent and the total of boron, silicon and carbon ranges from about 12 to 30 atom percent.

4,515,869
HOMOGENEOUS, DUCTILE NICKEL BASED HARDFACING FOILS

Debasis Bose, Randolph; Amitava Datta, Mendham; Nicholas J. DeCristofaro, Chatham, all of N.J., and Claude Henschel, Redwood City, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 285,883, Jul. 22, 1981, now abandoned. This application Jul. 21, 1983, Ser. No. 515,677

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.³ C22C *19/05*

U.S. Cl. 428—656 **1 Claim**

1. A hardfaced metal article, said article having been hardfaced with a homogeneous, ductile hardfacing foil composed of metastable material having at least 50 percent glassy structure and a composition consisting essentially of 0 to about 22 atom percent cobalt, 0 to about 4 atom percent iron, 7 to about 23.3 atom percent chromium, 0 to about 16 atom percent tungsten, 0 to about 5 atom percent molybdenum, about 2.5 to about 20 13 atom percent boron, 0 to about 8 atom percent silicon, 0 to 3.68 atom percent carbon and 38 to 68 atom percent nickel plus incidental impurities with the proviso that the total of iron, cobalt, nickel, chromium, tungsten and molybdenum ranges from about 70 to 88 atom percent and the total of boron, silicon and carbon ranges from about 12 to 30 atom percent.

4,515,870
HOMOGENEOUS, DUCTILE IRON BASED HARDFACING FOILS

Debasis Bose, Randolph; Amitava Datta, Mendham; Nicholas J. DeCristofaro, Catham, all of N.J., and Claude Henschel, Redwood City, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 515,678, Jul. 21, 1983, abandoned, which is a continuation of Ser. No. 285,884, Jul. 22, 1981, abandoned. This application Sep. 19, 1984, Ser. No. 652,167

Int. Cl.³ B22F *5/00;* **C23C** *1/10, 17/00*

U.S. Cl. 428—656 **1 Claim**

1. A hardfaced metal article, said article having been hardfaced with a homogeneous, ductile hardfacing foil composed of metastable material having at least 50 percent glassy structure and a composition consisting of 0 to about 25 atom percent cobalt, 0 to about 30 atom percent nickel, 0 to about 30 atom percent chromium, 0 to 5 atom percent tungsten, 0 to about 4 atom percent molybdenum, 4 to 17 atom percent boron, 0 to about 15 atom percent silicon, and 0 to about 5 atom percent carbon, the balance being iron plus incidental impurities with the proviso that the total of iron, cobalt, nickel, chromium, tungsten and molybdenum ranges from about 70 to 88 atom percent and the total of boron, silicon and carbon ranges from about 12 to 30 atom percent.

4,515,871
ELECTROCHEMICAL POWER GENERATOR

Tamotsu Shirogami, Yamato, and Mitsushi Ueno, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 16, 1983, Ser. No. 523,598

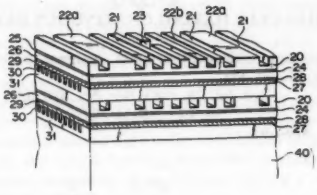
Claims priority, application Japan, Aug. 31, 1982, 57-149985

Int. Cl.³ H01M *2/00*

U.S. Cl. 429—34 **10 Claims**

1. An electrochemical power generator which is comprised of a plurality of unit cells stacked with interconnectors interposed therebetween, said unit cells each being comprised of an anode comprising a porous carbon plate having on its one surface a purality of grooves constituting gas passages and on its other surface an anode catalyst layer; a cathode comprising a plate having opposed first and second surfaces, and having on said first surface a cathode catalyst layer and applied on its said second surface the powder of hydrophobic material comprising a fluoropolymer resin; and an electrolyte layer interposed betweeen said anode and said cathode in such a manner that it is in contact, on opposite surfaces, with said anode catalyst layer and said cathode catalyst layer; said electrolyte being prepared by impregnating an acidic electrolyte into an inorganic compound powder exhibiting heat and chemical resistance; said interconnectors each consisting of a high density carbon plate and having, on one surface which is in contact with said cathode, a plurality of grooves constituting gas passages for a gas consisting essentially of hydrogen as an anode-active material and an oxidizing gas as a cathode-active material; said electric chemical power generator characterized in that first and second ribs, which said second ribs are wider than said first ribs, are formed between adjacent grooves of said anode substrate, said second ribs being present for every 5–10 of said first ribs; and wherein catalyst is dispersed in said cathode substrate over a range extending from the surface of said cathode substrate bearing said catalyst layer to a point within said cathode substrate.

6. An electrochemical power generator comprising a plurality of unit cells stacked with interconnectors interposed therebetween said unit cells each being comprised of an anode which comprises a porous carbon plate having opposed surfaces and bearing on one surface a plurality of grooves constituting gas passages and on its opposed surface an anode catalyst layer; a cathode defining two opposed surfaces and having on one said surface a cathode catalyst layer and on the surface opposed thereto a hydrophobic material powder comprising a fluoropolymer resin; and an electrolyte layer interposed between said anode and said cathode in such a fashion that it is in contact, at opposed surfaces, with said anode catalyst layer and said cathode catalyst layer, said electrolyte being prepared by impregnating an acidic electrolyte into an inorganic compound powder which exhibits heat and chemical resistance; said unit cells being further characterized by said interconnectors each comprising a high density carbon plate defining opposed surfaces and having, on said surface in contact with said cathode a plurality of grooves defining gas passages for an anode-active material consisting essentially of hydrogen and a cathode-active material consisting essentially of an oxidizing gas and wherein first and second ribs wider than said first ribs, are formed between adjacent grooves in said anode substrate, said second ribs each being formed with a groove closed at both ends, said groove being filled with a paste formed by impregnating an inorganic compound powder exhibiting heat and acid resistance with a concentrated acid solution; and wherein said cathode catalyst is dispersed in said cathode substrate over a range extending from said cathode catalyst surface to a point located inside said cathode substrate.



4,515,872
BATTERY PACK

Shizuo Okano, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Aug. 26, 1983, Ser. No. 526,854

Claims priority, application Japan, Sep. 9, 1982, 57-137507[U]

Int. Cl.³ H01M *2/06*

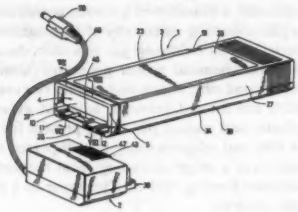
U.S. Cl. 429—65 **20 Claims**

1. A battery pack comprising:

a case defining a chamber therein and having an end periph-

eral wall defining a recess having an opening at one end thereof on the exterior,

a battery assembly composed of a plurality of interconnected unitary cells and housed in the chamber of said case, said battery assembly having two terminals of opposite polarities, and



contact terminal means electrically connected to the terminals of said battery assembly and mounted on the inner surface of said end peripheral wall within the recess of the case.

4,515,873

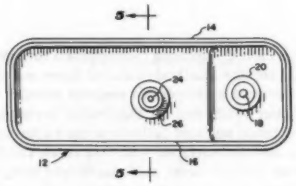
LITHIUM CELL HAVING CONTINUOUS DEPLETION GAUGE

Abel DeHaan, Pembrook Pines, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jul. 28, 1983, Ser. No. 518,200

Int. Cl.³ H01M *10/48*

U.S. Cl. 429—91 **4 Claims**



1. A lithium cell comprising:

an outer conductive housing;

at least one cathode member being positioned within the conductive housing and having two major surfaces one of which is in direct electrical contact with the conductive housing;

an insulative separator being positioned against the other major surface of the cathode member;

a lithium anode having first and second major surfaces, said first surface thereof is positioned adjacent to the insulative separator;

an anode lead electrically connected to the lithium anode, said lead extending out of the conductive housing and being electrically insulated from the housing;

an elongate electrically resistive sensing element formed of a material which exhibits a resistance which is dependent upon the length thereof and having an electrical resistance greater than the electrical resistance of lithium, said elongated sensing element being disposed within said lithium anode so as to extend generally in a direction from the first major surface of said lithium anode to the second major surface of said anode, said sensing element comprising an electrically resistive strip member and an insulative strip member, said electrically resistive strip member having an outer surface and an inner surface, said outer surface facing in a direction toward said first major surface of said lithium anode and said inner surface facing in a direction toward said second major surface of said lithium anode, said outer surface being in direct electrical contact with said lithium anode until said lithium anode is consumed, and said insulative strip member being disposed on said inner surface of said electrically resistive strip member and insulating said electrically resistive strip member from said lithium anode; and,

an electrical conductor connected to said sensing element and extending out of said conductive housing and being electrically insulated from said housing so that as the lithium anode is consumed by discharge of the cell the electrical resistance between the conductive housing and the electrical conductor provides a positive indication of the level of discharge of the cell.

4,515,874

ELECTROCHEMICAL STORAGE CELL

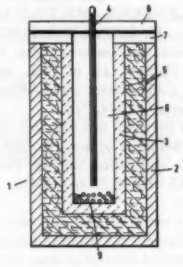
Günther Steinleitner, Schriesheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Ag, Mannheim, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,645

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117382

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—104 **6 Claims**



1. In an electrochemical storage cell of the alkali metal and chalcogen type with at least one anode space for the alkali metal anolyte, and a cathode space for the chalcogen catholyte, with the anode space and the cathode space separated from each other by an alkali ion-conducting solid electrolyte wall, the improvement comprising the addition in the anode space of sodium and of a capturing material with O_2-getter properties in an amount sufficient to absorb oxygen bound to water which is dragged in the cell with the hygroscopic solid electrolyte or oxygen which is diffused into the anodic space, wherein the capturing substance is a metal selected from the group consisting of metals of the third main group of the periodic system of the elements, and the amount of capturing agent relative to the sodium is a mass ratio between 1:10 and 1:100.

4,515,875

INORGANIC RECHARGEABLE NON-AQUEOUS CELL

William L. Bowden, Nashua, N.H., and Arabinda N. Dey, Needham, Mass., assignors to Duracell Inc., Bethel, Conn.

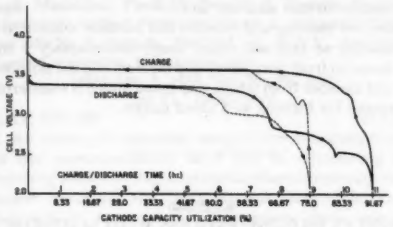
Continuation-in-part of Ser. No. 330,128, Dec. 14, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,690

Int. Cl.³ H01M *6/14, 4/36*

U.S. Cl. 429—196 **7 Claims**

6. A totally inorganic rechargeable non-aqueous electrochemical cell comprising a lithium anode and an electrolyte consisting essentially of $LiAlCl_4$ dissolved in SO_2 character-

ized in that said cell contains a cathode comprised of at least 60% by weight of $CuCl_2$ with said $CuCl_2$ being admixed with



a conductive carbon material and wherein said $CuCl_2$ discharges in preference to said sulfur dioxide.

4,515,876
X-RAY LITHOGRAPHY MASK AND METHOD FOR FABRICATING THE SAME

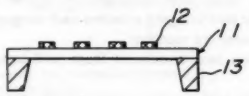
Hideo Yoshihara, Yokohama; Akira Ozawa, Ebina; Misao Sekimoto, Yokohama, and Toshiro Ono, Isehara, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

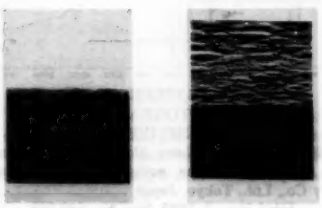
Filed Jul. 15, 1983, Ser. No. 513,954

Claims priority, application Japan, Jul. 17, 1982, 57-124714; Jun. 24, 1983, 58-112916

Int. Cl.³ G03F 9/00

U.S. Cl. 430—5 **13 Claims**





7. A method for fabricating an X-ray lithography mask, comprising

a first step which includes placing a specimen having an X-ray mask substrate on a specimen table in a sputtering apparatus having means for supplying a rare gas and means for controlling the pressure of the rare gas so that the specimen is electrically insulated from ground potential so that said specimen is electrically floating with respect to ground potential;

a second step which includes forming a layer of a metal having a high melting point directly on said X-ray mask substrate in said apparatus while subjecting said specimen to an RF power field and exposing said specimen to the rare gas and maintaining the flow rate and pressure of the rare gas at values selected to cause the layer of high melting point metal to contain granular crystal graips in the direction of the thickness of that layer, the granular crystal grains causing the layer to have a substantially zero internal stress, said step of forming including controlling the RF power field and the pressure of the rare gas for maintaining the surface of said specimen at a floating potential in the range of −10 to −20 V; and

a third step of forming an X-ray absorber layer with a predetermined pattern from said high melting point metal by reactive sputter etching.

4,515,877
IMAGE-RECORDING MATERIALS AND IMAGE-RECORDING CARRIED OUT USING THESE TO PRODUCE AN OPTICAL MASK

Helmut Barzynski, Bad Durkheim, and Klaus Holoch, Bobenheim-Roxheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 22, 1983, Ser. No. 554,327

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243943

Int. Cl.³ G03F 9/00

U.S. Cl. 430—5 **7 Claims**

1. A resist film which comprises a dimensionally stable base (B), which is transparent to actinic light in the wavelength range from 300 to 420 nm, and a mask-forming layer (ML) which is applied on the base, wherein the said layer (ML) is sensitive to heat radiation and contains a thermochromic system which, when irradiated with an IR laser having a wavelength greater than 1.00 μm, undergoes an irreversible change in its absorption spectrum in the range from 300 to 420 nm so that the optical density of the mask-forming layer (ML) in this wavelength range changes by not less than 1.3 units.

7. A process for the production of an optical mask, wherein a resist film consisting of a dimensionally stable base (B), which is transparent to actinic light in the wavelength range from 300 to 420 nm, and a mask-forming layer (ML) as claimed in claim 1 is exposed imagewise to an IR laser having a wavelength greater than 1.00 μm.

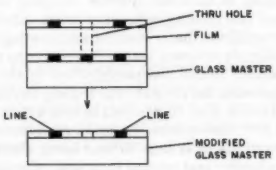
4,515,878
PRINTED CIRCUIT BOARD MODIFICATION PROCESS

Douglas J. Hall, Newark Valley; Robert F. Langley, Vestal, and Edwin L. Thomas, Apalachin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 412,653, Aug. 30, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 587,727

Int. Cl.³ G03F 9/00

U.S. Cl. 430—5 **5 Claims**



1. A process for modifying at least a portion of a pattern of circuit lines and lands on a printed circuit board in accordance with engineering change data, said pattern of circuit lines and lands on said circuit board being produced from a glass master having an emulsion pattern corresponding to said circuit lines and lands, comprising the steps of:

making a film copy of said glass master, said film copy including a complete image of said pattern of circuit lines and lands on said circuit board;

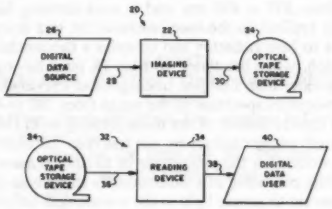
drilling a hole through a portion to be modified of said image of said pattern of circuit lines and lands on said film copy under control of the engineering change data, said portion of said image corresponding to said portion to be modified of said emulsion pattern on said glass master;

verifying the accuracy of the drilled hole;
registering said film copy over said glass master with said hole in said film copy in alignment with said portion to be modified of said emulsion pattern of said glass master;
changing said portion of said emulsion pattern on the glass master by using said hole in said film copy thereby producing a modified glass master;
verifying the accuracy of the modified glass master; and
using the modified glass master to produce a modified printed circuit board.

4,515,879
OPTICAL MASS MEMORY SYSTEM USING ELECTROPHOTOGRAPHY

Manfred R. Kuehnle, New London, N.H.; Lysle D. Cahill, Dayton; John C. Butler, Centerville, both of Ohio, and Lawrence J. Bassuk, Des Plaines, Ill., assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Apr. 28, 1983, Ser. No. 489,309
Int. Cl.³ G03G *13/22*
U.S. Cl. 430—31 **23 Claims**



1. For use in an optical mass memory system, a device for recording digital data, comprising:
a source of radiant energy providing a beam of radiant enery;
modulator means for modulating said beam in response to said digital data to form at least one ray of radiant energy representing said digital data;
electrophotographic imaging means for producing a toned image representing said digital data, the imaging means including an electrophotographic member having substrate means carrying thin film coatings at least one of which is a thin film coating of a photoconductive material less than 1 micron in thickness, and means contiguous to the coating to facilitate uniform charging thereof before exposure, said coating being very dense, wholly inorganic, microcrystalline, the crystals of said coating being generally uniformly oriented vertically relative to the surface of the substrate means, substantially free of effective barrier layers between the crystals, the coating having light transmissivity of at least 70 percent, having a dark resistivity of at least 10^{12} ohm-centimeters and a ratio between dark and light resistivity of at least 10^4 and being electrically anisotropic whereby said coating is capable of accepting a rapid charge and retaining same sufficient to enable toning, the imaging means further including charging, imaging, toning and transfer stations located sequentially adjacent said member, the surface of said member being charged at said charging station with a uniform electrical charge, the charged surface then being exposed to said rays at said exposing station to form an electrostatic latent image of discharged elements on the surface of said member, the elements representing said digital data, and the latent image being developed at said toning station with toner particles to result in a toned image that is an optically discernible physical representation of said digital data;
a storage medium in the form of a tape of at least partially resinous material, a portion of which is arranged adjacent said electrophotographic member at said transfer station, said transfer station including transfer means for heating and urging said medium against said member to transfer the toned image to the medium with the transferred toned image retaining its representation of the digital data after transfer to said medium; and
means for moving said member and medium relative to one another so that said toned image continuously is transferred to fresh portions of said medium and the portions of said member from which said toned image is transferred is reused for forming said toned image.

4,515,880
REFLEX IMAGING PROCESS WITH MAGNETIC IMAGES

Stephen L. Gaudioso, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 24, 1980, Ser. No. 190,112
Int. Cl.³ G03G *19/00*
U.S. Cl. 430—39 **10 Claims**

1. A method of developing latent magnetic images obtained by reflex thermomagnetic recording comprising the steps of:
(a) erasing and then magnetizing a reflex imaging member having a support transparent to light and particulate hard magnetic material opaque to said light dispersed in discrete areas bound to said support;
(b) placing a document to be copied in contact with said imaging member;
(c) directing light through said imaging member to said document and back to said imaging member by imagewise reflection from said document to expose said magnetic material in said imaging member and imagewise demagnetize said imaging member;
(d) separating said document from said imaging member; and
(e) contacting said imaging member with magnetizable toner particles which have been subjected to a D.C. magnetizing field having a magnetic strength of between about 200 gauss and about 5,000 gauss whereby said toner particles retain a residual internal magnetic field after removal of said magnetizing field.

4,515,881
ELECTROPHOTOGRAPHIC BISAZO PHOTOSENSITIVE MEMBER

Kiyoshi Sawada; Satoshi Goto; Akira Kinoshita, and Osamu Sasaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1983, Ser. No. 549,589
Int. Cl.³ G03G *5/06, 5/14*
U.S. Cl. 430—58 **23 Claims**

1. An electrophotographic photosensitive member comprising an electroconductive support and a photosensitive layer on said support,
R_2 is an aryl group; and
R_3 and $R_{3'}$ are each an alkyl group, an alkenyl group, an aralkyl group or an aryl group.

2. The electrophotographic photosensitive member according to claim 1, wherein the photosensitive layer comprises a carrier generating layer and a carrier transporting layer, and said carrier generating layer contains the bisazo compound.

4,515,882

OVERCOATED ELECTROPHOTOGRAPHIC IMAGING SYSTEM

Joseph Mammino, Penfield; Donald S. Sypula; Dennis A. Abramsohn, both of Pittsford; Martin A. Abkowitz, Webster, and Merlin E. Scharfe, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1984, Ser. No. 567,840

Int. Cl.³ G03G 5/14

U.S. Cl. 430—58 **15 Claims**

1. An electrophotographic imaging member comprising at least one photoconductive layer and an overcoating layer comprising a film forming continuous phase comprising charge transport molecules and finely divided charge injection enabling particles dispersed in said continuous phase, said overcoating layer having a thickness between about 1 micrometer and about 15 micrometers and being substantially transparent to activating radiation to which said photoconductive layer is sensitive and substantially electrically insulating at low electrical fields.

4,515,883

STILBENE DERIVATIVES, DISTYRYL DERIVATIVES AND ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR COMPRISING AT LEAST ONE OF THE DERIVATIVES

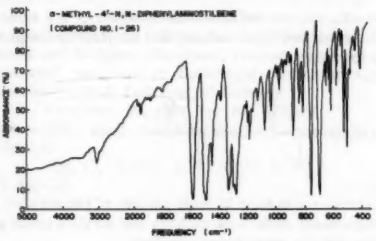
Massomi Sasaki, Susono, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,022

Claims priority, application Japan, Apr. 14, 1983, 58-64526; Apr. 14, 1983, 58-64527; Apr. 14, 1983, 58-64528; Apr. 14, 1983, 58-64529

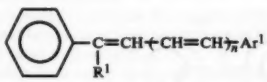
Int. Cl.³ G03G 5/06, 5/14

U.S. Cl. 430—58 **9 Claims**



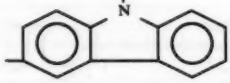
1. An electrophotographic photoconductor comprising an electroconductive support material and a photosensitive layer overlayed thereon containing at least one compound selected from the group consisting of:

(i) stilbene derivatives of formula (I)

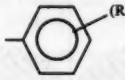


(I)

wherein R^1 represents an alkyl group or an aralkyl group, Ar^1 represents an unsubstituted or substituted naphthyl group, an unsubstituted or substituted anthryl group, or



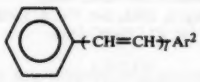
(in which R^2 represents an alkyl group or an unsubstituted or substituted phenyl group), or



(in which R^3 represents hydrogen, an alkyl grup, an alkoxy group, an alkylenedioxy group, halogen or a substituted amino group represented by

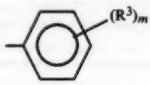
wherein R^4 and R^5 each represent an alkyl group, an unsubstituted or substituted aralkyl group, or an unsubstituted or substituted aryl group, m is an integer of 1, 2 or 3, and when m is an integer of 2 or 3, R^3's may be the same or different), and n is an integer of 0 or 1, and

(ii) distyryl derivatives of formula (II)



(II)

wherein Ar^2 represents an unsubstituted or substituted naphthyl group,



(in which R^3 represents hydrogen, an alkyl group, an alkoxy group, an alkylenedioxy group, halogen or a substituted amino group represented by

wherein R^4 and R^5 each represent an alkyl group, an unsubstituted or substituted aralkyl group, or an unsubstituted or substituted aryl group, m is an integer of 1, 2 or 3, and when m is an integer of 2 or 3, R^3's may be the same or different), and l is an integer of 2 or 3.

4,515,884

FUSING SYSTEM WITH UNBLENDED SILICONE OIL

John R. Field, Red Creek; Haribhajan S. Kocher, Penfield, and Arthur C. Martellock, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 420,996

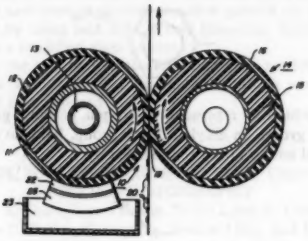
Int. Cl.³ G03G 13/20

U.S. Cl. 430—99 **19 Claims**

1. The method of fusing toner images to a substrate comprising providing a fusing member having a silicone elastomer fusing surface, heating said fuser member to an elevated temperature to fuse said toner to said substrate,

applying directly to said silicone elastomer fusing surface in non-emulsified form an unblended polydimethyl siloxane

having a kinematic viscosity of from about 7,000 centistokes to about 20,000 centistokes, and contacting the



toner image on said substrate with said heated fusing member to thereby fuse said toner image to said substrate.

4,515,885

DIAZO VESICULAR IMAGING FILMS WITH NITRATE SALT

Kenneth G. Gatzke, Lake Elmo, and John M. Winslow, South Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 1, 1983, Ser. No. 518,955
Int. Cl.³ G03C *1/60*
U.S. Cl. 430—175 **18 Claims**

1. A vesicular imaging film comprising a transparent or translucent substrate having on at least one surface thereof a photosensitive layer at a pH level which is not above 8.5 comprising on a weight basis of said photosensitive layer:

a. 70–95% by weight of a water-soluble binder consisting essentially of poly(vinyl alcohol)

b. 0.08 to 3.5% by weight of a photosensitive diazo material, and

c. 4.5 to 25% by weight of a nitrate salt.

4,515,886

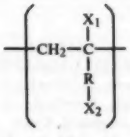
PHOTOSENSITIVE COMPOSITIONS

Tsuguo Yamaoka, Chiba, and Mitsutoshi Fukuda, Yamaguchi, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,872
Claims priority, application Japan, Feb. 16, 1983, 58-22873; Feb. 17, 1983, 58-23764
Int. Cl.³ G03C *1/71, 1/72*
U.S. Cl. 430—270 **17 Claims**

1. A photosensitive composition consisting essentially of a solution of:

(A) a photosensitive high polymer or copolymer consisting essentially of repeating units of the formula:



wherein X_1 is hydrogen, a halogen atom, C_1–C_4 haloalkyl group, or a C_1–C_4 alkyl group; X_2 is a halogen atom or a C_1–C_4 haloalkyl group; and R is an aromatic or heterocyclic ring; and

(B) a photosensitizing organic compound selected from the group consisting of p-methoxybenzoic acid, p-amyloxybenzoic acid, anthraquinone, 3-chloroanthraquinone, hexane diamine, acetanilide, aromatic nitro compounds, arylamines, alicyclic amino compounds, and heterocyclic compounds.

4,515,887

PHOTOPATTERNABLE DIELECTRIC COMPOSITIONS, METHOD FOR MAKING AND USE

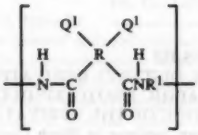
Gary C. Davis, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

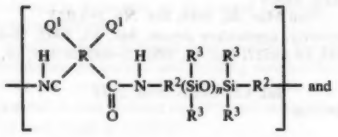
Filed Aug. 29, 1983, Ser. No. 527,581
Int. Cl.³ G03C *1/70*
U.S. Cl. 430—283 **4 Claims**

1. A photosensitive silicone-polyamide acid composition comprising by weight,

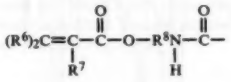
(A) up to 95% of an inert organic solvent,

(B) at least 5% of a modified silicone-aromatic polyamide acid consisting essentially of chemically combined units of the formulas,



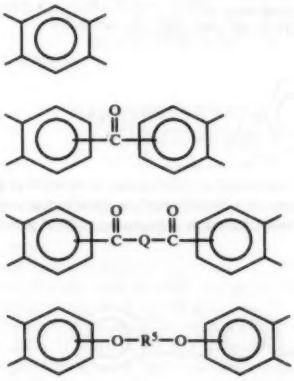


(C) an effective amount of sensitizer, where Q^1 is a monovalent radical selected from carboxy and acrylate amide groups of the formula,



and there are at least 10 mole percent of the acrylate amide groups based on the total carboxy and acrylate amide groups in the silicone-aromatic polyamide,

where R is a tetravalent $C_{(6-30)}$ aromatic radical selected from



R^1 is a divalent $C_{(2-13)}$ organic radical, R^2 is a divalent $C_{(2-8)}$ organo radical, R^3 is selected from $C_{(1-3)}$ monovalent hydrocarbon radicals and substituted $C_{(1-13)}$ monovalent hydrocarbon radicals, Q is a divalent radical having the formula,

$$-ZR^4Z-,$$

Z is selected from —O— and —NH—, R^4 and R^5 are selected from $C_{(2-13)}$ organic radicals, R^6 and R^7 are selected from hydrogen and $C_{(1-8)}$ alkyl radicals, R^8 is a $C_{(1-13)}$ divalent organo radical and n is an integer equal to 1 to 20 inclusive.

4,515,888
CYANINE DYES FOR SENSITIZING SILVER HALIDE EMULSIONS TO INFRARED RADIATION AND PHOTOGRAPHIC ELEMENTS INCLUDING THEM

Paolo Beretta, Ferrania, Italy, and Jonathan P. Kitchin, Ware, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

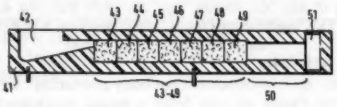
Filed Jun. 30, 1983, Ser. No. 509,347
Int. Cl.³ G03C *1/02*
U.S. Cl. 430—584 **17 Claims**

1. A photographic emulsion including gelatin and silver halide grains dispersed therein having grains associated with sensitizing dyes to make them sensitive to infrared rays, characterized by the sensitizing dyes being cyanine dyes including two nitrogen-containing heterocyclic nuclei linked to each other through a rigidized conjugated methine chain to form an amidinium-ion resonance system, said chain having 7, 9 or 11 carbon atoms and at least one of said nuclei is 5-methyl-6-methoxy-benzothiazole.

4,515,889
METHOD FOR CARRYING OUT ANALYTICAL DETERMINATIONS

Sigmar Klose, Berg; Fritz Stähler, Tutzing; Hans Lange, Lampertheim, and Wolfgang Kleemann, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,205
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044385
Int. Cl.³ G01N *33/48, 33/54, 21/07*
U.S. Cl. 435—4 **7 Claims**



1. A method of carrying out an analytical determination on a liquid sample, comprising:

(a) predisposing at least one dry reagent which is soluble in the liquid sample in at least some of a plurality of interconnected small hollow spaces;

(b) centrifugally forcing the liquid sample into and through the plurality of interconnected small hollow spaces;

(c) selecting the centrifugal force and the flow resistance of the plurality of interconnected small hollow spaces with regard to one another and so centrifuging for a period of time sufficient to allow the dry reagent to dissolve substantially in the liquid sample and to mix as reaction components in the plurality of interconnected small hollow spaces before they pass therefrom;

(d) centrifugally passing the reaction components from the plurality of interconnected small hollow spaces to a measuring chamber; and

(e) measuring a parameter of the reaction components in the measuring chamber to form the analytical determination.

4,515,890
IMMUNOASSAY OF TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE

George L. Manderino, Gurnee, and Adoracion F. Suarez, Chicago, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 8, 1982, Ser. No. 440,129
Int. Cl.³ C12Q *1/66;* G01N *33/54, 33/58*
U.S. Cl. 435—7 **10 Claims**

1. A method for quantitatively determining terminal deoxynucleotidyl transferase (TdT) antigen in a sample comprising:

(a) extracting the TdT antigen from the sample by treating the sample with an effective amount of an extractant composition comprising a nonionic surfactant, anticoagulant and a reducing agent which stabilizes TdT by preventing intermolecular disulfide bond formation of the TdT and preventing oxidation of TdT in a buffered medium;

(b) contacting the extracted TdT antigen with a solid support coated with anti-TdT thereby forming an antigen-anti-TdT complex on the solid support;

(c) treating the antigen-antibody complex on the solid support with a labeled anti-TdT antibody specific for TdT antigen to form an antibody-antigen-anti-TdT complex on the solid support; and

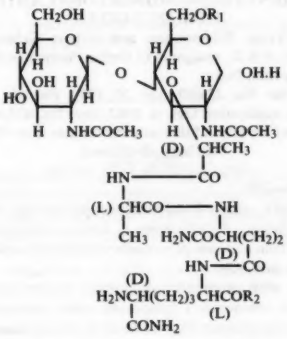
(d) determining the amount of antibody-antigen-anti-TdT complex formed as a measure of TdT antigen present in the sample.

4,515,891
PROCESS FOR THE PRODUCTION OF DISACCHARIDE-TRIPEPTIDE AND DISACCHARIDE-TETRAPEPTIDE

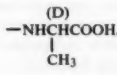
Kanae Yokogawa, Nara; Shozo Kotani, Monoh; Shigeo Kawata, Kobe, and Yoshiyuki Takase, Amagasaki, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 4, 1983, Ser. No. 455,581
Claims priority, application Japan, Jan. 22, 1982, 57-9237
Int. Cl.³ C12P *21/02, 21/06;* C12N *9/48, 9/52*
U.S. Cl. 435—69 **13 Claims**

1. A process for the production of a disaccharide-tripeptide and disaccharide-tetrapeptide of the formula:



wherein R_1 is hydrogen or acetyl, R_2 is hydroxy or



and (D) and (L) designate configuration, which comprises applying a purified endo-N-acetylmuramidase from *Streptomyces globisporus* and a purified D-alanyl-meso-2,6-diaminopimelic acid endopeptidase from *Streptomyces nitroporeus* SK

(FERM BP-216) or *Streptomyces globisporus,* to hydrolyze selectively cell walls of *Lactobacillus plantarum* or *Corynebacterium diphtheriae,* which cell walls contain a muramic acid moiety wherein the amino group is acetylated, isoglutamine and meso-2,6-diaminopimelic acid having an amidated carboxyl group as constituents of cell wall peptidoglycan, and isolating the resultant product in the form of a single compound.

4,515,892

FERMENTATION PROCESS

Nai Y. Chen, Titusville, and Joseph N. Misle, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 230,461, Feb. 2, 1981, Pat. No. 4,420,561. This application Oct. 28, 1983, Ser. No. 546,331

The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.

Int. Cl.³ C12P *7/06*

U.S. Cl. 435—161 **9 Claims**

1. In an ethanol fermentation process in which an aqueous solution of fermentable sugar is converted by an ethanol-producing microorganism to a dilute aqueous solution of ethanol with the ethanol being present in the solution at a concentration which does not exceed a predetermined maximum level, said predetermined maximum level of ethanol being selected to be that which is below the level of ethanol causing fermentation to selectively cease, an improvement is provided which comprises selectively sorbing ethanol present in the solution during fermentation with a hydrophobic crystalline aluminosilicate zeolite having a silica to alumina ratio of greater than about 12 and a constraint index within the range of 1 to 12 so that the non-sorbed ethanol present in the solution does not exceed the predetermined maximum level of concentration therein, and thereafter desorbing sorbed ethanol from the zeolite by stripping said zeolite with carbon dioxide obtained from the ethanol fermentation process.

4,515,893

HYBRID CELL LINE FOR PRODUCING COMPLEMENT-FIXING MONOCLONAL ANTIBODY TO HUMAN T CELLS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 33,669, Apr. 26, 1979, Pat. No. 4,361,549. This application Oct. 4, 1982, Ser. No. 432,452

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.³ C12N *5/00, 15/00*

U.S. Cl. 435—240 **7 Claims**

1. An IgG monoclonal-antibody-producing hybridoma formed by fusion of cells from a mouse myeloma line and spleen cells from a mouse previously immunized with human T cells, which antibody:

(a) reacts with essentially all normal human peripheral T cells and cutaneous T lymphoma cells, but not with normal human peripheral B cells, null cells or macrophages;

(b) reacts with from about 5% to about 10% of normal human thymocytes;

(c) reacts with leukemic cells from humans with T cell chronic lymphoblastic leukemia but does not react with leukemic cells from humans with T cell acute lymphoblastic leukemia, null cell acute lymphoblastic leukemia, or B cell chronic lymphatic leukemia;

(d) reacts weakly with the human T cell line HJD-1 but does not react with CEM, Laz 191, or HMl;

(e) does not react with the Epstein-Barr virus-transformed human B cell lines Laz 007, Laz 156, Laz 256, or SB; and

(f) fixes complement.

4,515,894

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO HUMAN T CELLS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 22,132, Mar. 20, 1979, Pat. No. 4,363,799. This application Oct. 4, 1982, Ser. No. 432,453

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.³ C12N *5/00, 15/00*

U.S. Cl. 435—240 **7 Claims**

1. An IgG monoclonal-antibody-producing hybridoma formed by fusion of cells from a mouse myeloma line and spleen cells from a mouse previously immunized with human T cells, which antibody:

(a) reacts with essentially all normal human peripheral T cells but not with normal human peripheral B cells, null cells or macrophages;

(b) reacts with from about 5% to about 10% of normal human thymocytes;

(c) reacts with leukemic cells from humans with T cell chronic lymphoblastic leukemia but does not react with leukemic cells from humans with T cell acute lymphoblastic leukemia;

(d) exhibits a pattern of reactivity with the human T cell lines HJD-1, CEM, and HSB-2 shown in FIG. 4; and

(e) does not react with Epstein-Barr virus-transformed human B cell lines.

4,515,895

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO HUMAN HELPER T CELLS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 33,639, Apr. 26, 1979, Pat. No. 4,381,295. This application Oct. 4, 1982, Ser. No. 432,459

Int. Cl.³ C12N *5/00, 15/00*

U.S. Cl. 435—240 **7 Claims**

1. An IgG monoclonal-antibody-producing hybridoma formed by fusion of cells from a mouse myeloma line and spleen cells from a mouse previously immunized with human T cells, which antibody:

(a) reacts with essentially all normal human peripheral helper T cells (being about 55% of all normal human peripheral T cells), but not with normal human peripheral B cells, null cells or macrophages;

(b) reacts with about 80% of normal human thymocytes;

(c) does not react with leukemic cells from humans with T cell chronic lymphoblastic leukemia, B cell chronic lymphoblastic leukemia, T cell acute lymphoblastic leukemia, or null cell acute lymphoblastic leukemia;

(d) reacts with the human T cell line CEM, but not with HJD-1, Laz 191, or HM1;

(e) does not react with Epstein-Barr virus-transformed human B cell lines Laz 007, Laz 156, Laz 256, or SB;

(f) reacts with about 55% of Rhesus monkey peripheral T cells;

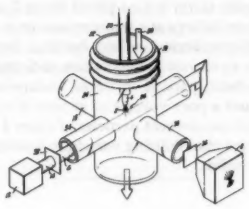
(g) fixes complement; and

(h) defines a T cell population ($OKT4^+$) which is unreactive with anti-TH_2 serum and is only minimally cytotoxic.

4,515,896
FLUORESCENT ADDITIVES FOR THE DETERMINATION OF CONDENSED AND VAPOR PHASES IN MULTIPHASE SYSTEMS

Lynn A. Melton, Richardson, Tex., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,729
Int. Cl.³ G01N *21/63, 21/64*
U.S. Cl. 436—2 **4 Claims**



1. A method for determining the spatial and phase distribution of a liquid-vapor multiphase fluid comprising:

adding a fluorescent monomer and a quencher to a fluid,

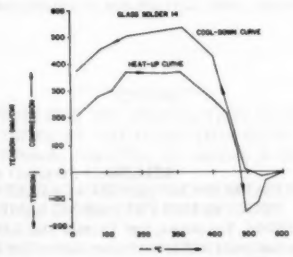
dispersing the fluid to produce a liquid-vapor multiphase fluid,

exciting the monomer by directing an energy source of a proper wavelength at the dispersed fluid, the excited monomer then combines with the quencher to produce a fluorescent exciplex in the dispersed fluid, determining the spatial and phase distribution of the dispersed fluid by detecting the relative fluorescence of both the fluorescent monomer and exciplex in the dispersed fluid, said fluorescent monomer being present primarily in the vapor phase and said fluorescent exciplex being present primarily in the liquid phase.

4,515,897
CRYSTALLIZING GLASS SOLDERS AND STRIPPING FILMS WITH SUCH GLASS SOLDER IMPRINTED THEREON

Werner Sack, and Werner Kiefer, both of Mainz, Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Jan. 23, 1984, Ser. No. 572,998
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302774; Jan. 28, 1983, 8302243[U]
Int. Cl.³ C03C *7/02, 3/22, 3/10, 3/04*
U.S. Cl. 501—15 **5 Claims**



1. A partially crystallizing glass solder, exhibiting, after having been sintered at a temperature of greater than 850° C. from glass powder larger than 100 μm, thermal expansion coefficients in the range of 20°-500° C. from −23.5 to $34.3 \cdot 10^{-7} \cdot K^{-1}$, differential thermoanalysis $peak_{max}$ temperatures (at a heating rate of 2.7 K/min or 6 K/min) lying below 710° C. and crystal phases consisting predominantly of h-quartz mixed crystal phase, and consisting essentially of, calculated as oxide weight percents, the following:

SiO_2	23.0–44.0 Wt. %,
Al_2O_3	20.0–37.0 Wt. %,
Li_2O	5.5–11.0 Wt. %,
B_2O_3	3.0–20.0 Wt. %,
PbO	0–36.0 Wt. %,
Na_2O	0–1.0 Wt. %,
K_2O	0–1.5 Wt. %,
F	0–0.1 Wt. %,
TiO_2	0–4.0 Wt. %,
MgO	0–3.5 Wt. %,
CoO	0–2.0 Wt. %,
$B_2O_3 + PbO + Na_2O + K_2O + F + TiO_2$	8.5–50.0 Wt. %.

4,515,898
GLASS BONDING MEANS AND METHOD

Earl K. Davis, Tempe; James E. Drye, and David J. Reed, both of Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 298,435, Sep. 1, 1981, abandoned. This application May 25, 1984, Ser. No. 614,573
Int. Cl.³ C03C *3/10, 3/12*
U.S. Cl. 501—15 **3 Claims**

1. A glass material consisting essentially of a composition by weight percent of:

GeO_2	4–14
SiO_2	0–4
PbO	50–80
PbF_2	0–7
B_2O_3	11–17
Al_2O_3	4–9
ZnO	0–7
V_2O_5	0.6–3
CdO	0–7

and having a coefficient of thermal expansion in the range $84–87 \times 10^{-7}$/°C. from 25° to 300° C.

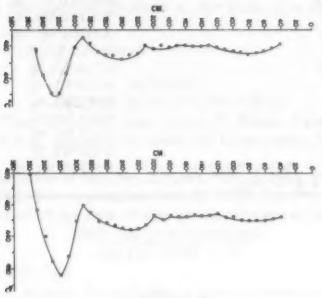
4,515,899
STEAM REGENERATION OF PHOSPHORUS TREATED VANADIUM-PHOSPHORUS-OXYGEN CATALYSTS

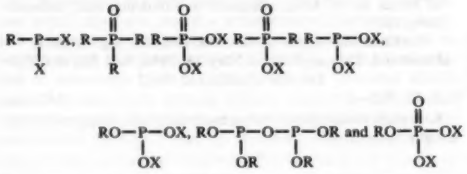
Gaylon T. Click, Pearland, and Bruno J. Barone, Houston, both of Tex., assignors to Denka Chemical Corporation, Houston, Tex.

Filed Dec. 14, 1983, Ser. No. 561,320
Int. Cl.³ B01J *27/28;* **C07D** *307/60*
U.S. Cl. 502—35 **16 Claims**

1. In a method for regenerating a vanadium-phosphorus - oxygen vapor phase oxidation catalyst used in the production of maleic anhydride from n-C_4 hydrocarbons containing P:V in an atomic ratio of ½ to 3:1 comprising contacting said catalyst with phosphorus compound of phosphorus halide, phosphorus oxyhalide, organic phosphines, organic phosphites, organic phosphates or mixtures thereof at a temperature in the range of about 0° to 600° C., whereby said catalyst exhibits a first yield wherein the improvement comprises thereafter contacting said catalyst with a flow of steam at a temperature in the range of about 300° C. to about 600° C. in an amount and for sufficient duration such that said catalyst exhibits a second yield greater than said first yield.

10. The method according to claim 1 wherein said phosphorus compound is an organo-phosphorus compound selected from the group consisting of





wherein R is phenyl or an alkyl radical of one to 6 carbon atoms and X is H or R.

14. The method according to claim 1 wherein said phosphorus compound is an alkyl ester of phosphoric acid having the formula $(R'O)_3P{=}O$ wherein R' is hydrogen or an alkyl radical having one to six carbon atoms at least one R' being an alkyl radical.

4,515,900

SORBENT USEFUL IN A VISBREAKING TREATMENT OF CARBO-METALLIC OILS

William P. Hettinger, Jr., and Hubert W. Beck, both of Russell, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 281,797, Jul. 9, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,100

Int. Cl.³ B01J *21/16*

U.S. Cl. 502—63 **8 Claims**

1. A composition of matter comprising a clay of at least 0.4 cc/g pore volume prepared by slurring kaolinite clay with a high pore volume producing dispersant material which will thermally decompose, spray drying the slurry of clay and dispersant to form microspherical solids, heating said microspherical solids to an elevated temperature over a time period up to about 3 hours and thereafter slowly cooling the heated solids to about 300° F. over a time period up to about 16 hours.

2. The composition of claim 1 wherein the thermally decomposable dispersant material is a material selected from the group of materials comprising, sugar, carbon black, a thermally decomposable organic material, a thermally decomposable inorganic material such as salts of a molecular weight and structure providing desired pore size upon decomposition.

4. A method for preparing a solid sorbent clay particles of at least 0.4 cc/g pore volume which comprises,

forming a slurried mixture of kaolinite and sodium pyrophosphate in water,

adding alpha monhydrate alumina to said slurry during agitated mixing of the slurry,

adding sulfuric acid and water slowly to the stirred slurry to provide the slurry with a pH of about 3, spray drying the pH adjusted slurry at a temperature up to about 750° F. to form microspherical solids, heating the microspherical solids to an elevated temperature, and recovering a cooler clay sorbent particle material comprising an alumina binder and a pore volume of at least 0.5 cc/gm.

6. The solid clay sorbent particles of claim 4 to which one or more metals for immobilizing vanadium is added during preparation of the solids.

4,515,901

METHOD OF PREPARING PILLARED, INTERLAYERED CLAY CATALYST USING SOLUBLE CARBOHYDRATES

Azza A. Elattar, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,900

Int. Cl.³ B01J *21/16*

U.S. Cl. 502—63 **24 Claims**

1. A method of preparing an interlayered pillared clay comprising the steps of mixing a clay with a polar solvent, a soluble carbohydrate, and a soluble pillaring agent; drying said mixture and then heating said mixture at a temperature between 100° to 600° C. to decompose said carbohydrate and form said interlayered pillared clay.

6. The method of claim 1 wherein said pillaring agent comprises a metallic or organometallic compound.

7. The method of claim 6 wherein said metallic compound is selected from the compounds of boron, sillicon, aluminum, phosphorus, zinc and magnesium.

8. The method of claim 6 wherein said pillaring agent is selected from the group consisting of soluble siloxane disilanes, trisilanes, silicates, metal isopropoxides, soluble metal salts of acetate, carbonate, and oxalate.

9. The method of claim 8 wherein said pillaring agent is selected form the group consisting of boric acid, diethoxydisilane, hexaethoxydisilane, methysilicate, ethylsilicate, hexaethoxydisiloxane, other alkyl silicates, and aluminum isopropoxide.

4,515,902

HYDROCARBON CONVERSION CATALYST AND PROCESS FOR PREPARING SAME

Tomonori Shiotri, Yokohama, and Takashi Ino, Kawasaki, both of Japan, assignors to Research Association For Residual Oil Processing, Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,104

Claims priority, application Japan, Feb. 16, 1983, 58-22901

Int. Cl.³ B01J *29/06, 21/00*

U.S. Cl. 502—64 **5 Claims**

1. A hydrocarbon conversion catalyst consisting essentially of 3 to 40 weight percent of a crystalline aluminosilicate zeolite

and 60 to 97 weight percent of an alumina-magnesia matrix having a magnesia content of 2 to 50 weight percent, wherein the crystalline aluminosilicate zeolite is supported on the alumina-magnesia matrix.

4. A process for preparing a hydrocarbon conversion catalyst comprising 3 to 40 weight percent of zeolite and 60 to 97 weight percent of alumina-magnesia matrix, which process comprises adding an alkali to a mixture of an alumina hydrate and a magnesia hydrate to adjust the pH of said mixture into a weak alkaline side of pH 9 to 12, ageing said mixture with stirring at a temperature of 50° to 100° C. to form an alumina-magnesia hydrogel slurry, then mixing said hydrogel slurry with a crystalline aluminosilicate zeolite slurry and thereafter drying the resultant mixture.

4,515,903

CRACKING CATALYST

Jan-Erik A. Otterstedt, Surte; Sven G. Järas, Kungälv; Roland Pudas, Nödinge, and Lawrence L. Upson, Gothenburg, all of Sweden, assignors to Katalistiks B.V., Delfzijl, Netherlands

Continuation of Ser. No. 349,087, Feb. 12, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 581,272

Claims priority, application Sweden, Jun. 30, 1980, 8004825

Int. Cl.³ B01J *29/06, 33/00*

U.S. Cl. 502—68 **9 Claims**

6. A metal-poisoning-resistant cracking catalyst for hydrocarbons in a fluidized bed catalylic cracker, the catalyst being particulate and for fluidization, said catalyst including two components, the first component being an active cracking catalyst having a zeolite content of at least 20% and the second component consisting of particles having a matrix of kaolin and amorphous alumina-silica and being relatively inactive as a cracking catalyst as compared to said first component, said first and second components being intermixed and having a zeolite content in the catalyst as a whole of up to 50%, said first component having a mean particle size of from 80 to 125 μm and the second component having a mean particle size of from 30 to 75 μm, and said second component including a substance having CO conversion capacity.

4,515,904

CATALYSTS FOR THE PRODUCTION OF MALEIC ANHYDRIDE BY THE OXIDATION OF BUTANE

Robert C. Edwards, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 30, 1983, Ser. No. 537,983

Int. Cl.³ B01J *27/14;* **C07D** *307/60*

U.S. Cl. 502—209 **36 Claims**

1. A process for the manufacture of a phosphorus-vanadium oxide catalyst suitable for use in the manufacture of maleic anhydride from butane which process comprises reacting at a temperature of about 0° C. to about 200° C. a vanadium compound in an organic ether solvent having from about 2 to about 10 carbon atoms, with a phosphoryl halide in the presence of water or an aliphatic alcohol having from about 1 to about 8 carbon atoms, eliminating the solvent and activating the catalyst by the addition of butane or another hydrocarbon feedstock and a phosphorus compound at a temperature of about 300° C. to about 500° C.

4,515,905

PROCESS FOR FORMING A CATALYST AND THE CATALYTIC PRODUCT PRODUCED BY THE PROCESS

Jan Uytterhoeven, Louvain; Pierre Jacobs, Gooik; Ludo Adriaensen, Deerlijk, and Jan Geerts, Sint-Katelijne-Waver, all of Belgium, assignors to N. V. Bekaert S.A., Zwevegem, Bulgaria

Filed Nov. 4, 1983, Ser. No. 548,827

Claims priority, application Netherlands, Nov. 18, 1982, 8204477

Int. Cl.³ B01J *21/06, 23/26, 23/74, 35/02*

U.S. Cl. 502—309 **12 Claims**

1. A process for forming a catalyst having great heat conductivity and mechanical strength comprising a metallic carrier having a catalytically active metal-containing surface layer, the catalytic metal being other than a noble metal, including the steps of:

(a) taking wires comprised of a first non-noble metal to provide a carrier therefrom,

(b) initially coating said carrier with a matrix comprised of a second non-noble metal,

(c) subsequently diffusing said non-noble metal of said matrix into an underlying layer of said carrier by heating and drawing said wires thereby forming reduced diameter fibers,

(d) etching with an inorganic oxidizing acid as much as possible said matrix from the surface of said carrier thus exposing and oxidizing said underlying carrier layer, and,

(e) subsequently reducing said exposed oxidized carrier layer at a temperature sufficient to reduce said metals in said oxidized layer to form said catalytically active metal-containing surface layer on said metallic carrier.

4,515,906

ANISOTROPIC MICROPOROUS SUPPORTS IMPREGNATED WITH POLYMERIC ION-EXCHANGE MATERIALS

Dwayne Friesen; Walter C. Babcock, and Mark Tuttle, all of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.

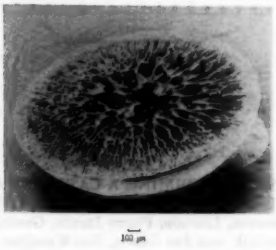
Filed Feb. 28, 1983, Ser. No. 470,371

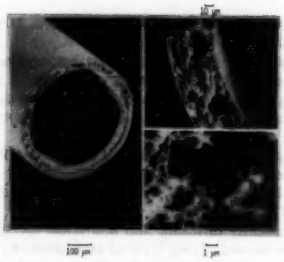
Int. Cl.³ C08D *5/20*

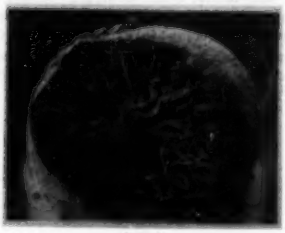
U.S. Cl. 521—28 **7 Claims**

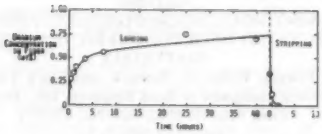
1. A composition of matter useful as ion-exchange media comprising a polymeric microporous support selected from the group consisting of polysulfones, polyvinylchlorides, polyacetonitriles, polyamides, polyphenylene oxides, polyvinylacetates, polyetherimides, polyvinylidene flourides, and derivatives and mixtures thereof, having an anisotropic pore

structure of small pores of less than 0.1 micron in diameter at the surface and large pores of from about 2 to about 200 microns in diameter in the interior, said large pores containing a polymeric ion-exchange or ion-complexing material and said small pores being sufficiently small to substantially prevent loss of said ion-exchange or ion-complexing material from said support, said polymeric ion-exchange or ion-complexing material being formed from polymerizable compounds that, following polymerization, contain a functional group selected from amides, amines, beta-dietones, hydroxyoximes, alkylphosphate esters, hydroxyquinolines, thiophosphate esters, hydroxyls, ethers, carboxyls and macrocyclic ethers and amines and alkyl-, aryl-, halogen-, and amino-substituted derivatives and mixtures thereof.









4,515,907

STYRENE POLYMER FOAM MADE WITH ALPHA-POLYOLEFIN ADDITIVES

Thomas W. McCullough, Newark, and Bradley D. Stevens, Frazeysburg, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 352,668, Feb. 26, 1982,. This application Mar. 16, 1984, Ser. No. 590,381

Int. Cl.³ C08J *9/00;* **B29D** *27/00*

U.S. Cl. 521—139 **2 Claims**

1. A foamable polyvinyl aromatic composition comprising a major amount of vinyl aromatic polymer and a compatible amount of an alpha-olefin polymer, wherein the alpha-olefin polymer is a mixture of alpha-olefin polymers which comprises from about 0.5 to about 40 weight percent, based on the mixture of alpha olefin polymer weight, of a copolymer of ethylene and vinyl acetate having polymerized therein from about 8.5 to about 28 percent by weight vinyl acetate, based on copolymer weight, and from about 100 to about 60 weight percent, based on mixture weight, of a blend of ethylene homopolymers and copolymers, the blend comprising from about 68 to about 75 weight percent of a copolymer of ethylene and a higher alkene having from 3 to 20 carbon atoms, based on the blend of alpha olefin polymer weight, and from about 32 to about 25 weight percent low density polyethylene, based on the blend of alpha olefin polymer weight said composition containing a blowing agent.

4,515,908

LIQUID FOAMS OF REINFORCED UNSATURATED POLYESTER RESINS AND PROCESS FOR MAKING THE SAME

Massimo Mazzola, Segni, and Aldo Cipriani, Colleferro, both of Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Division of Ser. No. 457,632, Jan. 13, 1983, Pat. No. 4,440,876, which is a continuation-in-part of Ser. No. 145,251, Apr. 30, 1980, abandoned. This application Apr. 2, 1984, Ser. No. 595,743

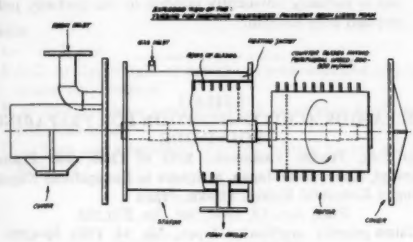
Claims priority, application Italy, Oct. 5, 1979, 22578 A/79

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—182 **3 Claims**

1. Fiber-reinforced liquid foams suitable for transforming into solid reinforced cellular materials having a density lower than 0.7 kg/l if no inert fillers are present or a density lower than 1 kg/l if inert fillers are present as well, said liquid foam being produced by a process comprising (1) mixing together an unsaturated polyester resin, a reinforcing material and, optionally an inert filler, said reinforcing material being selected from the group consisting of synethetic fibers, vegetable fibers and mineral fibers having a maximum length of 3 mm, whereby a liquid mixture is obtained; (2) transferring said liquid mixture of reinforcing material, unsaturated polyester resin and, optionally, said inert filler to a turbine having a free internal volume of at least 2 liters and comprising a rotor and a stator, both having either prismatic or cylindrical projections, said turbine rotor having a peripheral speed of greater than 200 m/min.; (3) introducing a gas into said turbine at a pressure of

from 1.1 to 10 absolute atmospheres, said turbine operating to distribute said gas in the form of small bubbles homogeneously



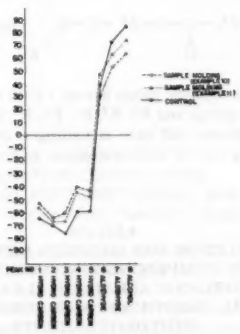
and uniformly throughout said mixture, thereby producing a reinforced foam of unsaturated polyester resin; thereafter discharging said reinforced foam from said turbine.

4,515,909

RESINOUS COMPOSITION FOR THE PROLONGED RELEASE OF FRAGRANT SUBSTANCES

Kiyohito Sawano, 11-19, Hadeshikogahara, Hiratsuka-shi, Kanagawa-ken; Ryujiro Kouichi, 83-75, Oodonoi, Noda-shi, Chiba-ken; Hideaki Oota, 4-3-3, Takeyama, Midori-ku, Yokohama-shi, Kanagawa-ken; Masashi Takano, 8-15-13, Sugita, Isogo-ku, Yokohama-shi, Kanagawa-ken, and Michio Moroe, 2-28-9, Shimorenjaku, Mitaka-shi, Tokyo, all of Japan

Filed Sep. 29, 1982, Ser. No. 426,799
Claims priority, application Japan, Feb. 16, 1982, 57-23455
Int. Cl.³ A61L *9/01, 9/04*
U.S. Cl. 523—102 **13 Claims**



1. A fragrant article, comprising an ethylene-vinyl acetate copolymer impregnated with a diffusing agent and a fragrant substance, said copolymer comprising from about 15% to about 30% of vinyl acetate monomer, by weight, and about 85% to about 70% of ethylene monomer, by weight, said diffusing agent being selected from the group consisting of benzyl benzoate, benzyl salicylate, and mixtures thereof, and being absorbed in the copolymer in an amount of from about 1% to about 10% by weight of the copolymer.

4,515,910

INTERPOLYMERIC RESIN FOR TREATMENT OF TEETH

Henry R. Rawls, 3245 DeSoto St., New Orleans, La. 70119; Allan E. Querens, 5652 Marcia Ave., New Orleans, La. 70124, and Barbara F. Zimmerman, 632 Phosphor Ave., Metairie, La. 70005

Filed Jan. 26, 1983, Ser. No. 461,026
Int. Cl.³ A61K *7/18;* **C08L** *27/12*
U.S. Cl. 523—115 **22 Claims**

1. An acrylic controlled fluoride releasing interpolymer comprising the reaction product of:

a. an anion-exchange-site bearing monomer carrying a fluoride ion in an amount sufficient to provide a caries-inhibiting amount of fluoride;

b. a copolymerizable acrylic monomer selected from the group consisting of alkyl acrylates and methacrylates wherein the alkyl group contains no more than about 12 carbon atoms; and

c. a monomer which is a crosslinker in the resulting interpolymeric resin.

4,515,911

SELF-CROSSLINKABLE ELECTROCOAT RESINS PREPARED BY ROOM TEMPERATURE REACTIONS BY EPOXY RESINS AND POLYAMINES CONTAINING PRIMARY AND TERTIARY AMINE GROUPS

Robert A. Swider, Livonia, and Martha E. Horsch, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01711, § 371 Date Oct. 31, 1983, § 102(e) Date Oct. 31, 1983
PCT Filed Oct. 31, 1983, Ser. No. 563,422
Int. Cl.³ C08L *63/00, 63/02;* **C09D** *3/58, 5/40*
U.S. Cl. 523—414 **20 Claims**

1. A cathodically electrodepositable coating composition characterized in that it comprises an aqueous dispersion of self-crosslinkable resin bearing amine and epoxide functionalities and being prepared by reacting:

(A) epoxy resin having (a) on average, more than one and up to about two epoxide groups per molecule, and (b) an epoxide equivalent weight of between about 400 and about 4000; and

(B) polyamine containing at least one primary amine group and at least one tertiary amine group per molecule and no other groups capable of reacting with epoxide groups,

(1) in a reaction mixture comprising between (i) a total of about 70 and about 25 weight percent of reactants (A) and (B) and (ii) between about 30 and about 75 weight percent organic solvent for said reactants, (2) in amounts so as to provide between about 0.25 and about 1.0 primary amine groups of (B) per each epoxide group of (A), (3) at a reaction mixture temperature of between about 18° and about 33° C., and (4) for a period of time sufficient to react between about 20 and about 50 percent of said epoxide groups with active amine hydrogens to form an amine and epoxide functional, partially crosslinked resin having a weight average ($\bar{M}_w$) molecular weight of between about 1300 and about 12,000, and

subsequently neutralizing amine groups present in said reaction mixture with water soluble acid in an amount sufficient to neutralize at least about 50 percent of said amine groups present therein, and thereafter dispersing said resin in water.

4,515,912

CURE SHRINK-RESISTANT MISSILE MOTOR CASES

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1984, Ser. No. 628,001
Int. Cl.³ F42B *1/00;* **C09B** *5/06;* **C06B** *45/10;* **C08K** *5/15*
U.S. Cl. 523—456 **4 Claims**

1. A matrix resin composition comprising:

a. about 100 parts by weight of a first component which is a two component mixture of approximately equal parts by weight of a diglycidyl ether of bisphenol A and an epoxidized dimer of oleic acid;
b. about 25 parts by weight of a second component of butanediol diglycidyl ether;
c. about 20 parts by weight of a third component of a curing agent of o-phenylenediamine-boron trifluoride etherate; and,
d. about 15 parts by weight of a fourth component of the bisspiroortho carbonate
3,9-bis(5'-norbornene-2'-yl)-1,5,7,11-tetraoxaspiro[5.5]undecane, said bisspiroortho carbonate being an expandable component during polymerization or curing phase of said matrix resin composition which achieves a conversion of said first three components of said matrix resin composition from a shrinkable matrix resin composition to an expanded matrix resin composition during polymerization or curing phase of said matrix resin composition.

4,515,913
DENTAL IMPRESSION COMPOSITION

Michael A. Pellico, Los Angeles, Calif., assignor to Laclede Professional Products, Inc., Gardena, Calif.

Continuation-in-part of Ser. No. 490,294, May 2, 1983, Pat. No. 4,468,484, which is a continuation-in-part of Ser. No. 378,917, May 17, 1982, Pat. No. 4,381,947, which is a continuation-in-part of Ser. No. 220,303, Dec. 29, 1980, abandoned. This application Nov. 14, 1983, Ser. No. 550,809
Int. Cl.³ A61K *6/08*
U.S. Cl. 523—109 **11 Claims**

1. In a powdered alginate, dental impression composition that is adapted to be mixed with water and is orally settable said powdered alginate composition containing:
from about 6 to about 10 wt.% of an alkali metal alginate selected from the group consisting of sodium alginate, potassium alginate and mixtures thereof,
from about 6 to about 12 wt.% of a calcium sulfate reactant,
from about 0.6 to about 1.2 wt.% of a reaction rate retarder selected from the group consisting of phosphate, pyrophosphate and tripolyphosphate salts of sodium, potassium and mixtures thereof, and a
filler,
the improvement which comprises polyacrylamide in said powdered alginate composition in an amount from about 0.5 to about 6.0 wt.% to thereby effect a smooth admixture of the powdered alginate composition with water.

4,515,914
CROSSLINKED LATEXES ENCAPSULATED WITH LINEAR POLYMERS

Michio Tsurumi, Yokohama, Japan, and Do I. Lee, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 19, 1983, Ser. No. 543,198
Int. Cl.³ C08L *9/00*
U.S. Cl. 523—201 **9 Claims**

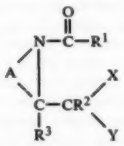
1. A process for preparing coalescence-capable and deformable aqueous polymer latexes having controlled crosslinking density wherein the dispersed polymer particles are heterogeneous, which process comprises:
(a) preparing by emulsion polymerization a core domain comprising the polymerization product of a portion of a first stage monomer mixture comprising at least one monovinyl aromatic monomer and at least one open chain conjugated diene monomer and
(b) contacting said first stage monomer mixture at a point at which said mixture is partially polymerized with a second stage monomer mixture comprising at least one monovinyl monomer and substantially noncrosslinkable monomers wherein said second stage monomer mixture is introduced when the rate of conversion of monomer to polymer is such that (1) the latex particles so formed are not highly crosslinked, and (2) the second stage monomer mixture is polymerized to yield essentially noncrosslinked linear polymers to encapsulate the core domain as a shell and is partially covalently bonded to the partially polymerized core domain.

4,515,915
POLYAMIDE ACID COMPOSITION FOR PREPARING POLYIMIDE

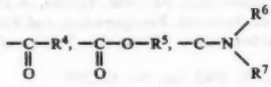
Junji Uda; Tsuneo Yamamoto, both of Otsu, and Takumi Kosugi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 13, 1984, Ser. No. 570,313
Claims priority, application Japan, Jan. 14, 1983, 58-4395
Int. Cl.³ C08L *79/08*
U.S. Cl. 524—87 **3 Claims**

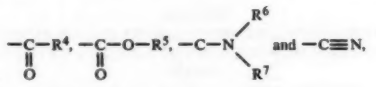
1. A polyamide acid composition for preparing a polyimide comprising a solution of a polyamide acid in an organic solvent which is a precursor of the polyimide and an N-substituted heterocyclic compound of the formula (I):


(I)

wherein A is a resisue of a N-heterocyclic ring containing only nitrogen and carbon atoms; X is a member selected from the group consisting of



Y is a member selected from the group consisting of



hydrogen, an aliphatic group having 1 to 12 carbon atoms and an aromatic group; and R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are the same or different and each is hydrogen atom, an aliphatic group having 1 to 12 carbon atoms or an aromatic group.

4,515,916
STABILIZERS FOR HALOGEN CONTAINING POLYMERS COMPRISING ZINC MERCAPTOESTERS, BASIC INORGANIC ALKALI OR ALKALINE EARTH METAL COMPOUNDS AND, SUBSTITUTED DIHYDROPYRIDINES

Kenneth R. Molt, Cincinnati, Ohio, assignor to Morton Thiokol Inc., Chicago, Ill.

Continuation of Ser. No. 379,426, May 18, 1982, , and a continuation-in-part of Ser. No. 269,085, Jun. 2, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 577,472
Int. Cl.³ C08K *5/36*
U.S. Cl. 524—99 **7 Claims**

1. A composition for stabilizing halogen containing polymers against the deteriorate effects of heat comprising:
A. at least one zinc mercaptoester having the formula:

(I)

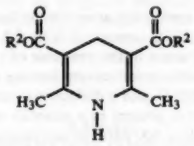
where

x=1 or 2; and

R is C_1 to C_{20} straight or branched-chain saturated or unsaturated alkyl radical;

B. at least one basic inorganic alkali or alkaline earth metal compound; and

C. at least one substituted dihydropyridine having the formula:



where R^2 is a C_1 to C_{20} straight or branched-chain saturated or unsaturated alkyl radical wherein the composition comprises about 15% to about 85% zinc mercaptoester, about 15% to about 85% basic inorganic alkali or alkaline earth metal compound, and about 1% to about 50% substituted dihydropyridine, all percentages being by weight based on the total weight the composition.

6. A polymer composition stabilized against the deteriorative effects of heat comprising a halogen containing polymer and a stabilizingly effective amount of the composition according to claim 1.

4,515,917

ADHESIVE COMPOSITION

Kazuhito Yamamoto, and Toshio Takenaka, both of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 1, 1983, Ser. No. 528,659

Int. Cl.³ C08K *5/57*

U.S. Cl. 524—178 **5 Claims**

1. An adhesive composition which consists essentially of a main component and an activating component, said main component comprising (A) at least one of acrylic and methacrylic monomers, (B) chlorosulfonated polyethylene or a mixture of chlorinated polyethylene and a sulfonyl chloride, (C) an organic peroxide, (D) a stabilizer selected from at least one member of the group consisting of hydroquinone, hydroquinone monomethyl ether, and 2,6-di-t-butyl-4-methyl-phenol and (E) an organic tin compound selected from the group consisting of di and tri(C_1–C_{18})alkyl or benzyl tin mono- and di-aliphatic carboxylates.

4,515,918

THERMOPLASTIC MOULDING COMPOSITIONS BASED ON POLYCARBONATE, POLYALKYLENE TEREPHTHALATE AND, OPTIONALLY, ONE OR MORE POLYMERS

Werner Nouvertné; Volker Serini; Dieter Neuray; Rudolf Binsack, all of Krefeld; Hans-Georg Gehrke, Odenthal; Dieter Rempel, Leverkusen, and Sivara Krishnai, Moers, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 518,071, Jul. 28, 1983, abandoned, which is a continuation of Ser. No. 375,390, May 6, 1982, abandoned. This application Apr. 20, 1984, Ser. No. 602,596

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118697

Int. Cl.³ C08L *67/02, 69/00*

U.S. Cl. 524—504 **5 Claims**

1. Thermoplastic moulding compositions comprising

(A) from 1 to 80 parts, by weight, of polybutylene terephthalate,

(B) from 20 to 99 parts, by weight, of bisphenol-A polycarbonate having an average molecular weight of from 10,000 to 200,000 as determined by measurement of the relative viscosity in dichloromethane at 25° C. using a concentration of 0.5%, by weight; polycarbonate (B) containing from 2 to 20%, by weight, based on (B), of o,o,o',o'-tetramethyl bisphenol-A polycarbonate and

(C) from 1 to 20 parts, by weight, of a polymer having a glass transition temperature below −20° C. selected from the group consisting of

(i) graft polymers obtained by grafting

(I) from 10 to 40%, by weight, based on the graft product, of monomers selected from the group consisting of (a) at least one (meth)acrylic acid ester, (b) a mixture of from 10 to 35%, by weight, based on the mixture, of acrylonitrile and from 65 to 90%, by weight, based on the mixture, of styrene, and mixtures of (a) and (b) on

(II) from 60 to 90%, by weight, based on the graft product, of a butadiene polymer containing at least 70%, by weight, based on (II), of butadiene residues as the graft base, the gel content of the graft base (II) amounting to ≧70% (as measured in toluene), the degree of grafting, G, to from 0.15 to 0.55 and the average particle diameter, d_{50}, of the graft polymer (C) to from 0.2 to 0.6 μm, and

(ii) graft polymers of

(a) from 25 to 98%, by weight, based on (C), of an acrylate rubber having a glass transition temperature below −20° C. as the graft base; and

(b) from 2 to 75%, by weight, based on (C), of at least one polymerisable ethylenically unsaturated monomer, of which the homo- or co-polymer(s) formed in the absence of (a) would have a glass transition temperature above 25° C., as the graft monomer, the quantities of components (A), (B), and (C) totalling 100 parts, by weight.

4,515,919

PROTECTIVE COATING COMPOSITION AND PROCESS FOR ALUMINUM AND ALUMINUM ALLOYS

Robert E. Bradley, Temple, Ga., and William R. Keithler, Kirkwood, Mo., assignors to Lockheed Corporation, Burbank, Calif.

Filed May 9, 1983, Ser. No. 493,062

Int. Cl.³ C08L *75/04*

U.S. Cl. 524—591 **10 Claims**

1. A protective coating composition for application to aluminum and aluminum alloy components during the sealing step of a typical anodizing process to seal and prime the component, said composition comprising:

(a) a colloidal, water-borne polyurethane elastomer resin;

(b) a cross-linking agent;

(c) a thermosetting catalyst; and

(d) a corrosion inhibiting agent.

4,515,920

SYNTHESIS OF PEPTIDES AND PROTEINS

Bruce W. Erickson, Closter, N.J., assignor to The Rockefeller University, New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,308

Int. Cl.³ C08F *210/00*; C07C *103/52*

U.S. Cl. 525—54.11 **4 Claims**

1. In the solid phase method for the synthesis of peptides or proteins in which an amino acid or protein is joined to a solid support and the desired peptide or protein is formed by stepwise addition of amino acid or peptide residues to produce the desired peptide or protein, the improvement comprising initially binding a trifunctional module to the solid support through one of its functional groups and thereafter synthesizing two identical peptides or proteins by stepwise addition of amino acid or peptide residues to each of the remaining pair of functional groups.

4,515,921

POLYCARBONATE COMPOSITIONS HAVING A HIGH IMPACT STRENGTH AND MELT FLOW RATE

Mark W. Witman, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

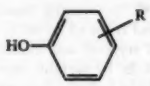
Filed Jul. 21, 1982, Ser. No. 400,548

Int. Cl.³ C08L *69/00*

U.S. Cl. 525—67 **5 Claims**

1. A composition comprising

(a) a polycarbon resin characterized in that its end groups are residues of



wherein R denotes a branched alkyl radical of 8 or 9 carbon atoms and in the alkyl radical the proportion of CH_3 protons is between 47% and 89% and the proportion of the sum of the CH and CH_2 protons is between about 53% and 11% and wherein R is in either the ortho or para position relative to the OH group, the upper limit of the ortho proportion being about 20%, and

(b) an impact modifier consisting of a rubber elastic polymer having a glass transition temperature below 0° C., said composition further characterized in that its melt flow rate per ASTM D-1238 at 300° C. is about 15 to about 19 gm/10 min. and in that said impact modifier is present at an amount of about 1 to 3 percent relative to the weight of said polycarbonate resin.

4,515,922

RUBBER COMPOSITIONS

Mitsuhiko Sakakibara; Masao Yoshizawa, both of Yokkaichi; Masaki Ogawa, Kodaira; Yasushi Hirata, Higashimurayama, and Shigeru Tomihira, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited and Japan Synthetic Rubber Co., Ltd., both of Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,427

Claims priority, application Japan, Jan. 31, 1983, 58-12886

Int. Cl.³ C08L *9/00*, *47/00*, *53/00*

U.S. Cl. 525—99 **9 Claims**

1. A rubber composition comprising (A) 10–90% by weight of polybutadiene rubber having a content of cis-1,4-bond of at least 80% and an average chain length of cis-1,4-bond of not less than 110, and (B) 10–90% by weight of random styrene-butadiene copolymer rubber obtained by copolymerization in the presence of an organic metal catalyst and having a content of bound styrene of not more than 40% by weight and a content of 1,2-bond in the total butadiene unit of 30–95%.

4,515,923

POLYAMINES AND A PROCESS FOR THEIR PRODUCTION

Rudolf Fauss, Cologne; Hans J. Meiners, Leverkusen; Werner Rasshofer, Cologne, and Holger Meyborg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,471

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223398

Int. Cl.³ C08G *18/18*; C09K *3/00*

U.S. Cl. 525—127 **12 Claims**

1. A single-stage process for the production of a polyamine containing aromatically bound primary amino groups comprising hydrolyzing

(a) a compound containing aromatically bound NCO-groups which has an NCO-content of from 0.5 to 40 wt % with

(b) an excess of water in the presence of

(c) a water-miscible polar solvent having a boiling point of from 56° to 250° C. and a dielectric constant of at least 10 which solvent is present in a quantity of at least 5 parts solvent for every 100 parts of isocyanate compound (a)

at a temperature of from −10° to 150° C. in a manner such that the reaction mixture is kept substantially homogeneous.

4,515,924

INJECTION MOLDABLE AMIDE-IMIDE POLYMERS AND COPOLYMERS CONTAINING SEMI-CRYSTALLINE AND AMORPHOUS POLYAMIDES

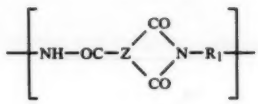
Gary T. Brooks, and Bill W. Cole, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 383,268, May 28, 1982, Pat. No. 4,467,011. This application May 6, 1983, Ser. No. 492,398

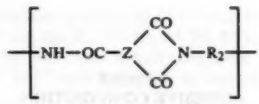
Int. Cl.³ C08L *77/00*; B23B *7/00*

U.S. Cl. 525—432 **9 Claims**

1. A composition of matter which comprises (A) an injection moldable copolymer comprising units of:



and units of:



wherein one carbonyl group of the injection moldable copolymer is meta to and one carbonyl group of the injection moldable copolymer is para to each amide group and wherein Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from about 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from about 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, $—SO_2—$, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit; and (B) about 0.1 to about 5 percent by weight of a polyamide selected from the group consisting of nylon 6, nylon 6/6, nylon 6/12, nylon 11 and nylon 12.

4,515,925
POLYCARBONATE/POLYBUTYLENE TEREPHTHALATE FILM

Frank Kleiner, Leverkusen; Rolf Kubens, Odenthal-Hahnenberg; Eckart Reese, and Joachim Wank, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,616

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237477

Int. Cl.³ C08L *67/02*

U.S. Cl. 525—439 **6 Claims**

1. A film comprising a mixture of

A. from 50 to 90% by weight of aromatic polycarbonate, and

B. from 10 to 50% by weight of polybutylene terephthalate the % by weight, being based on the total of A and B where after said film is monoaxially stretched, then upon heating said film shrinks in the direction of stretching, but substantially not transverse thereto.

4,515,926
COATING COMPOSITION COMPRISING BIS-DIENE OLIGOMERS AND BIS-DIENEOPHILE OLIGOMERS

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 6, 1983, Ser. No. 456,067

Int. Cl.³ C08L *67/06, 71/06*

U.S. Cl. 525—449 **24 Claims**

1. A novel thermosetting, solvent-based crosslinkable coating composition comprising:

(A) bis-diene oligomer of number average molecular weight about 300–5000, having the general formula A—R—A′, wherein A and A′ are the same or different and each comprises a substituted or unsubstituted monovalent diene moiety;

(B) bis-dieneophile oligomer of number average molecular weight about 400–1200, having the general formula B—R′—B′, wherein B and B′ are the same or different and each comprises a substituted or unsubstituted dieneophile moiety reactive with said diene moieties A or A′ at elevated cure temperature; said R and R′ being the same or different and each being a bivalent hydrocarbon linking moiety which is substantially unreactive with A, A′, B and B′;

wherein said bis-dieneophile oligomer consists essentially of bis-ene epoxy oligomer which is the reaction product of ene-functional monohydroxy monocarboxylic acid with aromatic or aliphatic diepoxide reactant and wherein at least one of A—R—A′ and B—R′—B′ bears crosslinking functionality other than diene and dieneophile functionality;

(C) crosslinking agent substantially reactive with said crosslinking functionality at said elevated cure temperature, wherein said crosslinking agent is selected from the group consisting of polyisocyanates, aminoplasts and formaldehyde polymers; and

(D) organic solvent.

4,515,927
PROCESS TO COPOLYMERIZE VINYL CHLORIDE AND CHLOROTRIFLUOROETHYLENE

Norman G. Gaylord, 28 Newcomb Dr., New Providence, N.J. 07974

Filed Mar. 11, 1983, Ser. No. 474,371

Int. Cl.³ C08F *214/24*

U.S. Cl. 526—87 **10 Claims**

1. A process for the suspension copolymerization of vinyl chloride and chlorotrifluoroethylene to form a copolymer having a constant weight ratio of vinyl chloride to chlorotrifluoroethylene comprising the steps of:

suspension copolymerizing vinyl chloride and chlorotrifluoroethylene using an initial charge having a weight ratio of vinyl chloride to chlorotrifluoroethylene of 55/45 to 75/25 to form a copolymer having a constant weight ratio of 75/25 to 95/5 vinyl chloride to chlorotrifluoroethylene; and

adding sufficient additional vinyl chloride to reconstitute the initial ratio of the vinyl chloride to chlorotrifluoroethylene charge prior to reaching 20% conversion.

4,515,928
ORGANIC PEROXIDE COMPOSITION CONTAINING TRIHYDRIC ALCOHOL, ALKALI OR ALKALINE EARTH METAL CHLORIDE, OR MONOSACCHARIDE

Richard A. Schwarz, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 20, 1982, Ser. No. 400,197

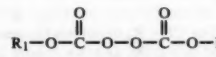
Int. Cl.³ C08F *2/00;* **C01B** *13/00, 15/00;* **C07K** *3/00*

U.S. Cl. 526—200 **7 Claims**

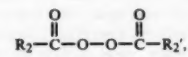
1. An organic peroxide composition consisting essentially of:

(a) an aqueous organic peroxide dispersion of from about 10 to 65 weight percent of an organic peroxide that is liquid at 0° C., water, and sufficient surfactant to provide a well dispersed peroxide, and

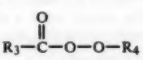
(b) between about 2 and about 30 weight percent, based on the amount of water in the organic peroxide dispersion, of a material selected from the group consisting of: (1) polyhydric paraffinic alcohols selected from the group consisting of pentaerythritol and 1,2,6-hexane triol, (2) monosaccharides, (3) metal chloride salts of the metals sodium, lithium, potassium and magnesium, and (4) mixtures of such materials, to provide a liquid peroxide composition which is pumpable at between about 0° C. and −20° C., said organic peroxide being selected from the group consisting of: (i) organic peroxydicarbonate esters represented by the graphic formula:



wherein R_1 and R_1' are each an alkyl radical of from 2 to 8 carbon atoms, (ii) diacyl peroxides represented by the graphic formula:



wherein R_2 and R_2' are each an alkyl radical of from 2 to 4 carbon atoms, and (iii) peroxyesters represented by the graphic formula:



wherein R_3 is an alkyl radical of from 2 to 12 carbon atoms and R_4 is alpha cumyl or an alkyl radical of from 4 to 5 carbon atoms.

4,515,929
PEROXIDE COMPOSITION

Robert H. Tang, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 28, 1983, Ser. No. 518,162

Int. Cl.³ C01B *13/00, 15/00;* **C09K** *3/00;* **C08F** *4/38*

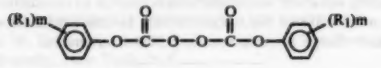
U.S. Cl. 526—228 **22 Claims**

1. A peroxide composition comprising:

(a) from about 10 to about 65 weight percent organic peroxide dispersed in an aqueous medium containing sufficient surfactant to provide a stable dispersion, and

(b) from 0.05 to 1 mole percent, basis the organic peroxide,

of diphenyl peroxydicarbonate stabilizer represented by the graphic formula:



wherein R_1 is a C_1–C_4 alkyl and m is 0, 1, 2, or 3, said amount of diphenyl peroxydicarbonate being sufficient to reduce the rate of self induced homolytic decomposition of the organic peroxide at temperatures of from 0° C. to +5° C.

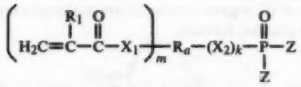
4,515,930

HIGHLY WATER-RESISTANT ADHESIVE

Ikuo Omura, and Junichi Yamauchi, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jan. 20, 1984, Ser. No. 572,245
Claims priority, application Japan, Jan. 27, 1983, 58-12272
Int. Cl.³ A61C *5/00*; C08F *130/02*
U.S. Cl. 526—276 **18 Claims**

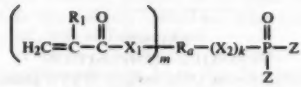
1. An adhesive which comprises a polymerizable composition consisting of (a) 1 part by weight of a monomer represented by the formula



where R_1 denotes H or CH_3; R_a denotes a C_{6-40} organic residue having a valence of m+1; X_1 and X_2 denote O, S, or NR', (where R' denotes H or a C_{1-6} hydrocarbon group), two of X_1 may be different from each other when m is 2; Z denotes a halogen; and m is 1 or 2 and k is 0 or 1, and (b) 0 to 199 parts by weight of a monomer selected from the group consisting of mono-, di-, tri-, and tetrafunctional (meth)acrylates, styrene, divinyl benzene, p-chlorostyrene, (meth)acrylamide or derivatives thereof, N-(hydroxymethyl)acrylamide, (meth)acrylic acid, isobutylvinyl ether, vinyl acetate, diethyl fumarate, diethyl maleate, maleic anhydride, methyl vinyl ketone, allyl chloride, vinyl naphthalene and vinylpyridine or combinations thereof.

14. A method for restoring a decayed tooth which comprises applying an adhesive to the surface of the tooth cavity and subsequently filling the cavity with a dental filling material composed of a polymerizable monomer, filler and curing agent, said adhesive comprising

(a) 1 part by weight of a polymerizable monomer represented by the formula



(where R_1 denotes H or CH_3; R_a denotes a C_{6-40} organic residue having a valence of m+1; X_1 and X_2 denote O, S, or NR', two of X_1 may be different from each other when m is 2; Z denotes a halogen; and m is 1 or 2 and k is 0 or 1),

(b) 0 to 199 parts by weight of monomer which is copolymerizable with said monomer (a), and

(c) 0.01 to 20 parts by weight of curing agent for 100 parts by weight of the polymerizable monomers.

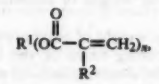
4,515,931

POLYFUNCTIONAL ACRYLATE MONOMERS AND POLYMERS THEREOF USEFUL AS CAPACITOR DIELECTRICS

Daniel R. Olson, and Timothy W. O'Donnell, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,894
Int. Cl.³ C08F *20/20*; C07F *69/54*
U.S. Cl. 526—323.2 **8 Claims**

1. A composition comprising at least one polyfunctional acrylate having the formula



(I)

wherein R^1 is an aliphatic or alicyclic radical having about 20–40 carbon atoms which contains from 0 up to about three non-conjugated olefinic linkages, R^2 is hydrogen or methyl, and n is from 2 to 4; at least about 40% of said polyfunctional acrylates containing alicyclic moieties.

4,515,932

END-CAPPING CATALYSTS FOR FORMING ALKOXY-FUNCTIONAL ONE COMPONENT RTV COMPOSITIONS

Rack H. Chung, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 427,930, Sep. 29, 1982, abandoned. This application May 8, 1984, Ser. No. 608,522
Int. Cl.³ C08G *77/06*
U.S. Cl. 528—16 **65 Claims**

1. A one-package substantially anhydrous room temperature vulcanizable organopolysiloxane composition convertible to a tack-free elastomer, comprising: (1) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least 1 hydroxy radical; (2) an effective amount of cross-linking agent; and (3) an effective amount of end-capping catalyst comprising a combination of (i) a Lewis acid and (ii) a compound selected from the group consisting of substituted guanidines, amines and mixtures thereof.

4,515,933

ONE-COMPONENT POLYURETHANE ADHESIVE COMPOSITIONS

Eugene Y. C. Chang, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 11, 1983, Ser. No. 483,984
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.³ C08G *18/10*, *18/22*
U.S. Cl. 528—57 **18 Claims**

1. A heat-curable one-component polyurethane composition, comprising: (a) a secondary or tertiary aliphatic diisocyanate prepolymer; (b) a polyol compound; (c) a chain extender selected from the group consisting of sucrose and sorbitol; and (d) a curingly effective amount of a catalyst selected from the group consisting of magnesium acetylacetonate, nickel acetylacetonate, magnesium stearate, cadmium stearate, and organic acid salts of 1,8-diazabicyclo[5.4.0]undec-7-ene.

4,515,934

VINYL ESTER RESINS CONTAINING TRIAZINE OR BOTH TRIAZINE AND OXAZOLINE GROUPS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 19, 1984, Ser. No. 590,819
Int. Cl.³ C08G 59/26; C08F 20/34
U.S. Cl. 528—92 28 Claims

1. A vinyl ester resin composition containing triazine groups or both triazine and oxazoline groups prepared by reacting (a) a polyepoxide containing triazine groups, or (b) a polyepoxide containing both triazine and oxazoline groups, or (c) a mixture of (a) and (b) above with (d) from about 0.75 to about 1 mole of a monounsaturated monocarboxylic acid or mixture of monounsaturated monocarboxylic acids per epoxide group in the presence of (e) an effective quantity of a suitable catalyst.

4,515,935

CATALYSTS FOR FOUNDRY CORE BINDERS

George S. Everett, Clarendon Hills, Ill., assignor to QO Chemicals, Inc., Chicago, Ill.

Continuation of Ser. No. 465,528, Feb. 11, 1983, abandoned, which is a division of Ser. No. 347,009, Feb. 8, 1982, abandoned, which is a division of Ser. No. 234,905, Feb. 17, 1981, Pat. No. 4,331,583. This application Jun. 22, 1984, Ser. No. 623,698
Int. Cl.³ C08G 85/00
U.S. Cl. 528—141 6 Claims

1. A process for curing an acid curable thermosetting resin selected from the group consisting of phenolaldehyde resins, urea-aldehyde resins, furfuryl alcohol-urea resins, furfuryl alcohol-formaldehyde resins, furfuryl alcohol-resorcinol resins, furfuryl alcohol-melamine resins, furfuryl alcohol polymers and polymers of furfuraldehyde which comprises contacting said resin with a catalyst comprising the reaction product of polyphosphoric acid and an aliphatic alcohol containing not more than 12 carbon atoms.

4,515,936

CATALYZED INTERFACIAL POLYCONDENSATION POLYCARBONATE PROCESS

Subhas K. Sikdar, Clifton Park, and Yaw D. Yeboah, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,634
Int. Cl.³ C08G 63/62
U.S. Cl. 528—200 16 Claims

1. A method of producing aromatic polycarbonate by a catalyzed interfacial polycondensation polycarbonate process comprising

(1) forming an agitated two-phase admixture comprising

(i) an organic phase containing an inert organic solvent and a polycondensation catalyst,

(ii) an aqueous phase containing dissolved therein an aromatic dihydroxy compound, a strong base and an ionic surfactant in a quantity of from about 100 to 1,000 parts per million having a pH of at least 11 subject to the proviso that

(a) the volume ratio of inert organic solvent phase to aqueous phase is within the range of from about 0.04:1 to 0.20:1 and

(b) the mole ratio of base to aromatic dihydroxy compound is at least about 0.25:1,

(2) adding and reacting a carbonyl halide with the aromatic dihydroxy compound to form an aromatic polycarbonate having a weight average molecular weight of at least about 2000, and

(3) separating and recovering the solid aromatic polycarbonate particulate from the liquid aqueous phase.

4,515,937

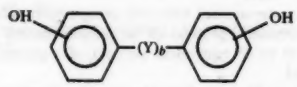
FLAME RESISTANT SULFUR-BEARING COPOLYCARBONATE

Arthur L. Baron, New Martinsville, W. Va., and Sivaram Krishnan, Moers, Fed. Rep. of Germany, assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 9, 1980, Ser. No. 185,632
Int. Cl.³ C08G 63/62
U.S. Cl. 528—204 6 Claims

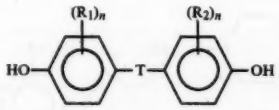
1. An aromatic high molecular weight copolycarbonate comprising the polymeric reaction product of solely

(i) an aromatic sulfur-free diphenol represented by the structural formula



wherein b is zero or 1, Y denotes an alkylene or alkylidene radical with 1 to 7 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 12 carbon atoms, —O— or —CO—;

(ii) a sulfur-containing diphenol represented by the formula



wherein R_1 and R_2 independently denote a lower alkyl selected from a group consisting of methyl, ethyl, propyl and butyl; n is equal to from 0 to 2 and T is either S, SO or SO_2;

(iii) a branching agent for polycarbonates;

(iv) a monophenol; and

(v) a carbonic acid derivative selected from a group consisting of phosgene, carbonyl bromide or bis-chloroformic esters of an aromatic dihydroxy compound;

characterized in that said branching agent comprises between 0.05 and 2%, relative to the molar sum of said (i) plus said (ii) and in that said copolycarbonate comprises at least 15 mol percent of said (ii) and in that they are classified V-O for 1/16" class specimens as evaluated by the procedure of Underwriter's Laboratories Bulletin 94.

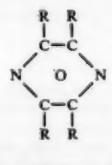
4,515,938

HYDROXYSTYRYLAZAPOLYMERS

Loren L. Swearingen, Clute, and Randy J. LaTulip, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 12, 1984, Ser. No. 588,597
Int. Cl.³ C08G 12/28, 12/26
U.S. Cl. 528—252 17 Claims

1. A thermosetting prepolymer which comprises the resinous reaction product of one or more hydroxy aromatic aldehydes and a compound having the formula



where R is hydrogen, methyl, or ethyl,

whereby the total number of methyl groups substituted on the ring is in the range from 2–4.

5. A cured polymer which comprises the product obtained

by curing the prepolymer of claims 1, 2, 3 or 4 at a temperature in the range from about 180° to about 300° C. for a time sufficient to obtain a cure.

4,515,939

POLY(ESTER-AMIDE) HOT-MELT ADHESIVES

Charles R. Fribart, Lawrenceville, and Richard L. Veazey, East Windsor Township, Mercer County both of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed May 31, 1983, Ser. No. 499,336

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—339.3 **18 Claims**

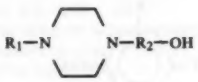
1. A poly(ester-amide) adhesive composition which comprises; the polymeric product of the polymerization of

(a) from 30 to 95 equivalent percent of a polymeric fatty acid; and

(b) from 5 to 70 equivalent percent of a dicarboxylic acid; and with a substantially equivalent amount of

(c) from 10 to 95 equivalent percent of an organic diamine; and

(d) from 5 to 90 equivalent percent of an alkanolamine of the formula:



(I)

wherein R_2 represents alkylene of 2 to 8 carbons, and R_1 is hydrogen.

4,515,940

PROCESS FOR THE PREPARATION OF ARYLDIAZOSULFONATES

Rüdiger Berthold, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,855

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125104

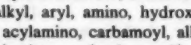
Int. Cl.³ C07C *113/04*

U.S. Cl. 534—565 **10 Claims**

1. A process for the preparation of a compound of the formula I

(I)

in which Ar represents an aromatic isocyclic structure or heterocyclic structure, R are identical or different and represent alkyl, aryl, amino, hydroxyl, alkoxy, aryloxy, halogen, nitro, acylamino, carbamoyl, alkylcarbamoyl, arylcarbamoyl, dialkylamino, arylamino, sulfo or sulfamoyl, M represents hydrogen, an alkali metal or one equivalent of an alkaline earth metal, and n represents 0 or an integer from 1 to 5, by reacting an aqueous solution of the diazonium salt of the formula II



(II)

in which Ar, R and n have the abovementioned meanings and Z^- represents one equivalent of an anion, with a solution or suspension of an alkali metal sulfite or alkaline earth metal sulfite, which comprises substantially excluding the presence of an excess of one of the two reactants during the reaction and wherein the diazonium salt solution is added as rapidly as is technically possible to the very rapidly stirred solution or suspension of the sulfite.

4,515,941

23-DEMYCINOSYLDESMYCOSIN DERIVATIVES

Tatsuro Fujiwara; Hideyuki Watanabe; Takao Hirano, and Hideo Sakakibara, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

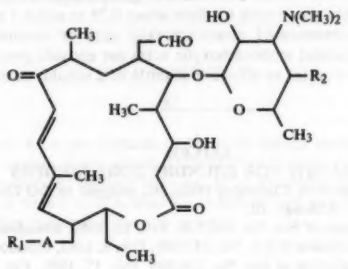
Filed Mar. 30, 1983, Ser. No. 480,398

Claims priority, application Japan, Apr. 7, 1982, 57-58767; Nov. 27, 1982, 57-207950; Dec. 28, 1982, 57-227555

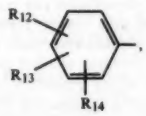
Int. Cl.³ C07H *17/08*

U.S. Cl. 536—7.1 **5 Claims**

1. A compound of the formula



or a non-toxic salt thereof, wherein A is oxygen or sulfur; R_1 is



in which R_{12}, R_{13} and R_{14} are each independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, nitro and di-lower alkylamino, or R_1 is

in which R_3 is phenyl and R_4 and R_5 are each independently selected from the group consisting of hydrogen, lower alkyl and phenyl; and

R_2 is hydrogen or hydroxyl.

4,515,942

ANTIBIOTICS KA-6606 XII, XIII, XV, XVI AND XVII

Akio Iwasaki, Kawasaki; Takeo Deushi, Higashimurayama; Isamu Watanabe, Higashimurayama, and Toshihito Mori, Higashimurayama, all of Japan, assignors to Kowa Company, Ltd., Aichi, Japan

Division of Ser. No. 281,898, Jul. 9, 1981, Pat. No. 4,425,430. This application Oct. 11, 1983, Ser. No. 541,291

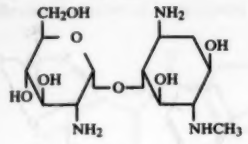
Claims priority, application Japan, Jul. 15, 1980, 55-95602; Dec. 27, 1980, 55-185087

Int. Cl.³ C07H *15/22*; C12P *19/48*

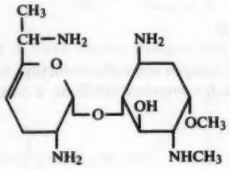
U.S. Cl. 536—16.8 **1 Claim**

1. A substantially pure material which is at least one member selected from the group consisting of antibiotics KA-6606 XII, XIII and XV to XVII of the following formulae

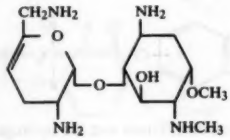
KA-6606 XII



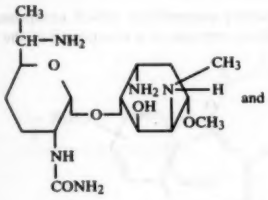
KA-6606 XIII



KA-6606 XV

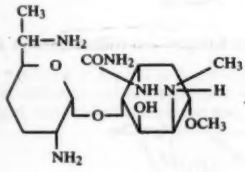


KA-6606 XVI



and

KA-6606 XVII



4,515,943

CRYSTAL OF BETA-NICOTINAMIDE-ADENINE-DINUCLEOTIDE AND PROCESS FOR PREPARING THE SAME

Toyofumi Miya; Yukiharu Kobayashi, and Masao Yano, all of Saiki, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 309,467, Oct. 7, 1981, abandoned. This application Apr. 19, 1983, Ser. No. 486,935

Claims priority, application Japan, Oct. 12, 1980, 55-143012

Int. Cl.³ C07H *19/20, 21/02*

U.S. Cl. 536—27 5 Claims

1. A crystalline free acid type β-nicotinamide-adenine-dinucleotide tetrahydrate which is a triclinic system and has a space group of $P\bar{1}$ or P1 and lattice constants: a=8.861 Å, b=11.181 Å, c=8.630 Å, α=90.82°, β=103.40° and γ=109.71°.

4,515,944

1,5-DIPHENYL-2-HALOALKYLPYRAZOLIN-3-ONE INTERMEDIATES

Henning Heinemann, Hanover, Fed. Rep. of Germany; Daniel Jasserand, Paris, France; Wolfgang Milkowski, Burgdorf, Fed. Rep. of Germany; Dimitri Yavordios, Chatillon sur Chalaronne, France, and Horst Zeugner, Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hannover, Fed. Rep. of Germany

Division of Ser. No. 409,631, Aug. 20, 1982, Pat. No. 4,442,102. This application Dec. 22, 1983, Ser. No. 564,399

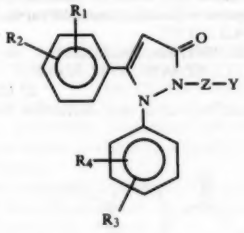
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132915

Int. Cl.³ C07D *231/08, 491/02*

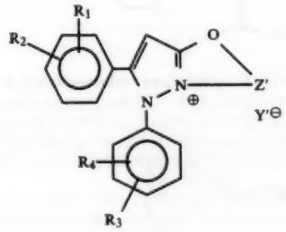
U.S. Cl. 544—91 1 Claim

1. A compound corresponding to one of the isomeric formulae II or III

II



III



wherein

R_1 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy, hydroxyl, trifluoromethyl or lower alkanoyloxy group,

R_2 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy group, or

R_1 and R_2 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy group,

R_3 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy, hydroxy, trifluoromethyl or lower alkanoyloxy group,

R_4 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy group, or

R_3 and R_4 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy group, Z is an alkylene group with 2 to 6 carbon atoms,

Z' is an alkylene group with 2 to 4 carbon atoms, Y is a halogen atom, and Y' is a halogen atom, and acid addition salts thereof.

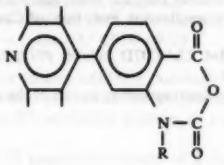
4,515,945

N-ALKYL-4-(4-PYRIDINYL)ISATOIC ANHYDRIDES

Paul F. Ranken, and Thomas J. Walter, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Aug. 15, 1983, Ser. No. 522,792
Int. Cl.³ C07D *265/26, 215/16*
U.S. Cl. 544—94 **3 Claims**

1. An N-alkyl-4-(4-pyridinyl)isatoic anhydride corresponding to the formula:



wherein R is an alkyl, haloalkyl, or hydroxyalkyl group containing 1–6 carbons.

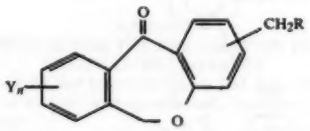
4,515,946

6,11-DIHYDRO-11-OXO-DIBENZ-[b,e]OXEPIN DERIVATIVES

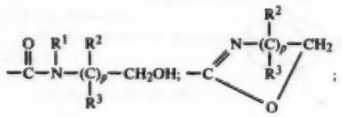
Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Dec. 23, 1981, Ser. No. 333,835
Int. Cl.³ C07D *313/00;* **A61K** *31/42, 31/335*
U.S. Cl. 548—237 **27 Claims**

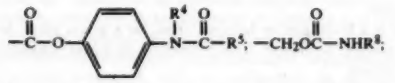
1. A 6,11-dihydrodibenz[b,e]oxepin acid derivative having the formula



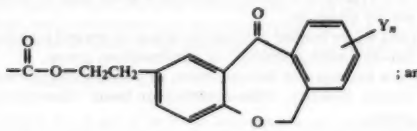
where Y is alkyl, alkoxy, halogen and trifluoromethyl, R is



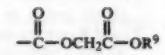
;



;

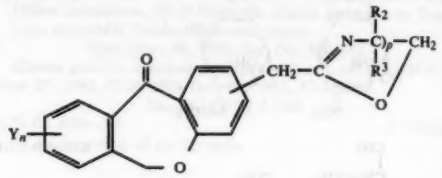


; and

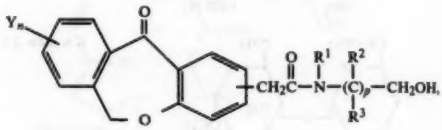


where n is 0, 1, 2 or 3; p is 1 or 2; q is 0, 1 or 2; R^1 to R^7 are the same or different and are hydrogen and alkyl; R^8 is hydrogen, alkyl and phenyl and R^9 is alkyl.

10. A method of preparing a compound of the formula

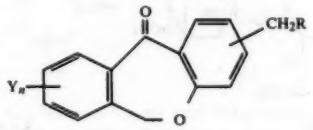


where Y is alkyl, alkoxy, halogen and trifluoromethyl, n is 0, 1, 2 or 3; p is 1 or 2; which comprises cyclizing a compound having the formula

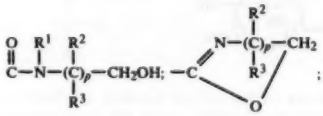


where R^1–R^3 are the same or different and are hydrogen and alkyl.

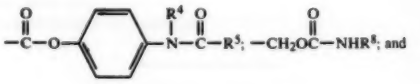
12. An antiinflammatory composition which comprises an effective antiinflammatory amount of a compound of the formula



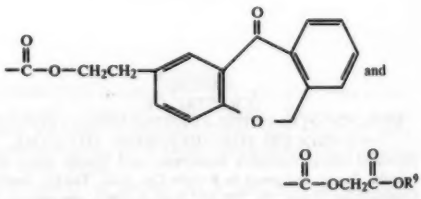
where Y is alkyl, alkoxy, halogen, and trifluoromethyl; R is



;



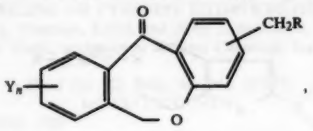
and



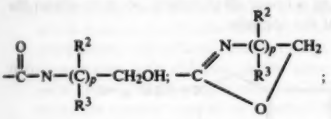
where n is 0, 1, 2 or 3; p is 1 or 2; q is 0, 1 or 2; R^1 to R^7 are the same or different and are hydrogen and lower alkyl and R^8 is hydrogen, lower alkyl and phenyl and R^9 is alkyl.

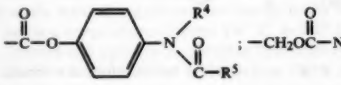
15. The composition as defined in claim **12** which comprises 2-(6,11-dihydro-11-oxodibenz[b,e]-oxepin-2-yl)methyl-4,4-dimethyloxazoline or a pharmaceutically acceptable salt thereof.

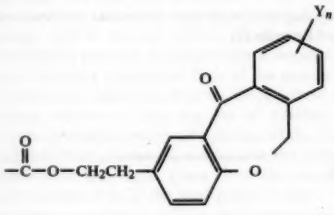
20. An analgesic composition which comprises an effective pain alleviating amount of a compound of the formula

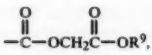


where Y is alkyl, alkoxy, halogen and trifluoromethyl; R is









where n is 0, 1 2 or 3; p is 1 or 2; q is 0, 1, or 2; R^1 to R^7 are the same or different and are hydrogen and lower alkyl, R^8 is hydrogen, lower alkyl and phenyl and R^9 is alkyl.

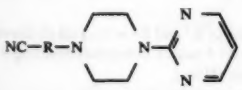
4,515,947

CYANOALKYLPIPERAZINES AND METHODS FOR THEIR PREPARATION AND USE

Louise O. Sandefur; Wojciech Slusarek, both of Rochester; Burton D. Wilson, Webster, and Cataldo A. Maggiulli, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1982, Ser. No. 407,216
Int. Cl.³ C07D *403/04*
U.S. Cl. 544—295 **22 Claims**

15. A method for preparing a 1(cyanoalkyl)-4-(2-pyrimidyl)-piperazine represented by the structural formula

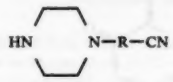


wherein R represents an alkylene group having from 1 to 5 carbon atoms, the method comprising the steps of:

(a) reacting piperazine with a haloalkylnitrile represented by the structural formula

X—R—CN

wherein X represents a halo group and R is as previously defined, in the presence of an acid acceptor to form a cyanoalkylpiperazine represented by the structural formula



wherein R is as previously defined, and

(b) reacting the cyanoalkylpiperazine with a 2-halopyrimidine in the presence of an acid acceptor to form the 1-(cyanoalkyl)-4-(2-pyrimidyl)piperazine.

4,515,948

2,4-DIAMINO-5-(4-AMINO AND 4-DIMETHYLAMINO-3,5-DIMETHOXY BENZYL)PYRIMIDINES

Ivan Kompis, Oberwil; Gérald Rey-Bellet, Basel, and Guido Zanetti, Füllinsdorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 63,292, Aug. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 795,828, May 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 504,416, Sep. 9, 1974, abandoned. This application Jun. 30, 1981, Ser. No. 279,106
Claims priority, application Switzerland, Sep. 12, 1973, 13057/73; Jul. 22, 1974, 10063/74
Int. Cl.³ C07D *239/48*
U.S. Cl. 544—325 **4 Claims**

1. A compound, 2,4-diamino-5-(4-amino-3,5-dimethoxybenzyl)-pyrimidine or a pharmaceutically acceptable acid addition salt thereof.

4. A compound, 2,4-diamino-5-[4-(dimethylamino)-3,5-dimethoxy-benzyl]-pyrimidine, or a pharmaceutically acceptable acid addition salt thereof.

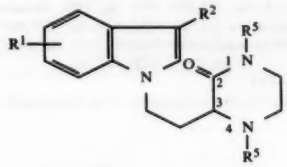
4,515,949

[2-(1H-INDOL-1-YL)ETHYL]-2-PIPERAZINE AND PYRIDO[1,2-a]INDOL-9-ONE AS INTERMEDIATES FOR PYRAZINO(2,3-3,4)PYRIDO(1,2-a) INDOLES WHICH ARE USEFUL FOR TREATING HYPERTENSION IN MAMMALS

George Santroch, San Francisco, Calif., and Ivo Jirkovsky, Montreal, Canada, assignors to American Home Products Corporation, New York, N.Y.

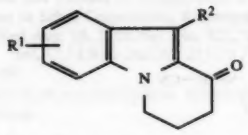
Division of Ser. No. 461,095, Jan. 26, 1983,. This application Feb. 27, 1984, Ser. No. 583,908
Int. Cl.³ C07D *241/36, 403/00, 451/00*; A61K *31/495*
U.S. Cl. 544—343 **6 Claims**

1. A compound of the formula



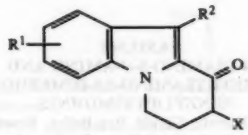
in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl; R^2 is hydrogen or lower alkyl having one to three carbon atoms; and R^5 is benzyl or lower alkyl.

3. A compound of the formula



in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl; and R^2 is hydrogen or lower alkyl having one to three carbon atoms.

5. A compound of the formula



in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl; R^2 is hydrogen or lower alkyl having one to three carbon atoms; and X is bromo or chloro.

4,515,950

PROCESS FOR THE ISOMERIZATION OF ERGOVINE DERIVATIVES

Zdenek Brich, and Herbert Mühle, both of Binningen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

PCT No. PCT/CH81/00105, § 371 Date Apr. 26, 1982, § 102(e) Date Apr. 26, 1982

PCT Filed Sep. 23, 1981, Ser. No. 375,290

Claims priority, application Switzerland, Sep. 23, 1980, 7122/80

Int. Cl.³ C07D *519/02*

U.S. Cl. 546—67 **19 Claims**

1. A process for the production of an 8α-substituted ergoline having an electron withdrawing group as the 8α-substituent which comprises the steps of

(1) producing an anion of an ergoline having an electron withdrawing substituent in the 8β-position by deprotonating the ergoline under strongly basic conditions with a strong non-nucleophilic lithium amide base and

(2) thereafter protonating the resultant anion.

4,515,951

PREPARATION OF 5,6,7,7A-TETRAHYDRO-4H-THIENO[3,2-c]PYRIDIN-2-ONE COMPOUNDS

Robert Boigegrain; Jean-Pierre Maffrand, both of Portet-sur-Garonne, France; Norio Suzuki, Chiba, Japan; Kynichi Matsubayachi, Funabashi, Japan, and Shinichiro Ashida, Ichikawa, Japan, assignors to Sanofi, Paris, France

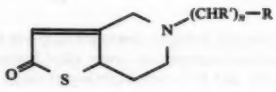
Division of Ser. No. 325,805, Nov. 30, 1981, abandoned. This application Jul. 25, 1984, Ser. No. 635,461

Claims priority, application France, Nov. 28, 1980, 80 25274

Int. Cl.³ C07D *495/04*

U.S. Cl. 546—114 **13 Claims**

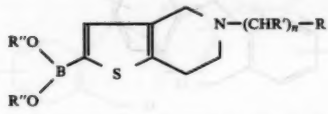
1. A process for the preparation of a compound of the formula:



(I)

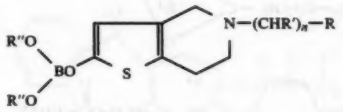
in which R is hydrogen or phenyl, R′ is hydrogen or a lower alkyl and n is 0, 1, 2, 3, or 4, which comprises the steps of:

(a) oxidizing a boronic acid derivative of the formula:



(V)

in which R, R′ and n are as hereinbefore described, and R″ is a hydrogen atom or a lower alkyl radical, so as to obtain the boric derivative of the formula;



(VI)

in which R, R′,R″ and n are as hereinbefore described, and then,

(b) hydrolyzing said boric acid derivative to obtain a compound of formula (I).

4,515,952

SYNTHESIS OF 2-PYRIDYLALKYLAMINES SUBSTITUTED ON THE PYRIDYL RING BY BROMINE

Brian M. Adger, Hildenborough near Tonbridge, and David J. O'Rourke, Cobham, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

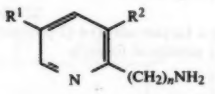
Filed Mar. 22, 1983, Ser. No. 477,037

Claims priority, application United Kingdom, Mar. 25, 1982, 8208749

Int. Cl.³ C07D *213/61*

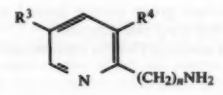
U.S. Cl. 546—329 **4 Claims**

1. A process for preparing a compound of formula (II):



(II)

and salts thereof where one of R^1 and R^2 is C_{1-4} alkyl, the other is bromo and n is from 3 to 5 which comprises reacting a salt of a compound of formula (III):



(III)

where one of R^3 and R^4 is C_{1-4} alkyl and the other is hydrogen with an electrophilic brominating agent in an oxidizing polar medium.

4,515,953
PRODUCTION OF POLYCHLORINATED PYRIDINE MIXTURES BY LIQUID PHASE CHLORINATION OF PYRIDINE OR PYRIDINE HYDROCHLORIDE

Michael J. Marinak, Kelso, and John L. Simonson, Longview, both of Wash., assignors to Kalama Chemical, Inc., Kalama, Wash.

Filed Apr. 22, 1983, Ser. No. 487,751
Int. Cl.³ C07D *213/61*
U.S. Cl. 546—345 **38 Claims**

1. The process of noncatalytically chlorinating pyridine or pyridine hydrochloride in the liquid phase without substantial formation of intractable nonvolatiles, said process comprising:

(a) establishing in a reactor means a diluent reactor charge which is made up of chlorinated pyridine and/or picoline compounds, said diluent reactor charge being essentially nonreactive with chlorine in the sense of forming one mole or less of hydrogen chloride per mole of diluent under the reaction conditions to which the reactants in the reactor means are subjected;

(b) while maintaining the reactor charge in the liquid phase and at a temperature of about 150° C. to 260° C., sparging chlorine and pyridine or pyridine hydrochloride into the reactor charge near the bottom thereof at a chlorine-to-pyridine feed ratio of at least about 4:1 by weight and at a feed rate low enough so that any separation of the reactor charge into a second, lighter phase composed of unchlorinated pyridine hydrochloride is minimized and is in any event less than about 10% of the reactor charge by volume, the excess of chlorine being fed to the reactor charge relative to the amount of pyridine being fed thereto providing enhanced agitation of the reaction mass and sufficient chlorine to ensure that the chlorine partial pressure in the vapor space over the reaction mass is greater than 50% of the total pressure; and

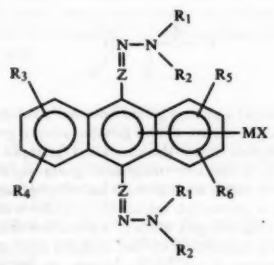
(c) continuing chlorine addition and maintaining such reaction conditions until substantial nuclear substitution of chlorine in the pyridine or pyridine hydrochloride has occurred.

4,515,954
METAL CHELATES OF ANTHRACENE-9,10-BIS-CARBONYLHYDRAZONES

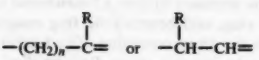
Stanley A. Lang, Jr., Blauvelt, and Keith C. Murdock, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 295,946, Aug. 24, 1981, abandoned. This application Jun. 6, 1983, Ser. No. 500,225
Int. Cl.³ C07D *233/06*
U.S. Cl. 548—109 **8 Claims**

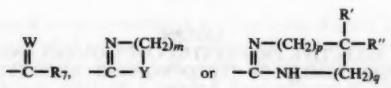
1. A chelated compound selected from the group consisting of those of the formula:



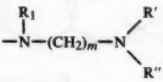
wherein Z is a trivalent moiety of the formulae:



wherein n is 0, 1, 2, or 3 and R is hydrogen or alkyl (C_1–C_4); R_1 is hydrogen or alkyl (C_1–C_4); R_2 is hydrogen, alkyl (C_1–C_4) or a monovalent moiety of the formulae:



wherein m is 2, 3, 4 or 5, p is 1, 2 or 3, q is 0, 1 or 2; R′ is hydrogen or alkyl (C_1–C_4); R″ is hydrogen or alkyl (C_1–C_4); R_7 is alkyl (C_1–C_4), amino, anilino, hydrazino, alkylamino (C_1–C_4), dialkylamino wherein each alkyl group has up to 4 carbon atoms, α-phenethylamino, β-phenethylamino, pyrrolidino, piperidino, N-methylpiperazino or a moiety of the formula:



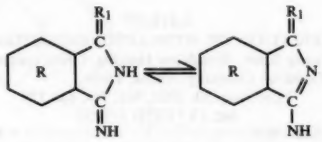
wherein m, R_1, R′ and R″ are as hereinbefore defined and the moiety —NR′R″ may be pyrrolidino, piperidino, morpholino or N-methylpiperazino; W is oxo (O=), thioxo (S=) or imino (R′—N= wherein R′ is as hereinbefore defined) and Y is oxy (—O—), thio (—S—), or methylene (—CH_2—); and R_3, R_4, R_5 and R_6 are each individually selected from the group consisting of hydrogen, halogen (F, Cl, Br, I), hydroxy, nitro, amino, sulfonamido, alkyl (C_1–C_3) and alkoxy (C_1–C_3); M is platinum, copper, iron, zirconium, cobalt, chromium or zinc; X is sulfate, halogen (F, Cl, Br, I), nitrate, dicyclopentadienyl or amine ligand; and the nontoxic pharmaceutically acceptable acid-addition and quaternary ammonium salts thereof.

4,515,955
ISOINDOLINE CATIONIC DYES

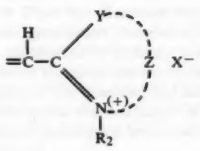
Robert F. Coles, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 8, 1982, Ser. No. 355,324
Int. Cl.³ C07D *413/06, 417/06, 403/06;* D06P *1/42*
U.S. Cl. 548—150 **13 Claims**

1. Isoindoline derivative monosubstituted in the 1-position corresponding to the formula



wherein the cyclic radical R is an aromatic ring, and R_1 is a substituent represented by the general formula



where Y is an oxygen, nitrogen, sulfur, or carbon atom, Z is the atom or atoms necessary to form a 5-membered or 6-membered heterocyclic ring, said heterocyclic ring consisting of atoms selected from the group consisting of carbon, nitrogen, sulfur, oxygen, and selenium ring atoms, R_2 is an alkyl, sulfoalkyl, or carboxyalkyl radical, and X^- is the anion for the cationic quaternary nitrogen.

4,515,956

SELECTIVE PREPARATION OF ISOMERS AND ENANTIOMERS OF CYCLOPROPANE CARBOXYLIC ACIDS

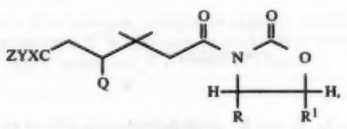
William A. Kleschick, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 450,500, Dec. 16, 1982, Pat. No. 4,479,005. This application Aug. 13, 1984, Ser. No. 639,768

Int. Cl.³ C07D *263/24, 263/26*

U.S. Cl. 548—230 **17 Claims**

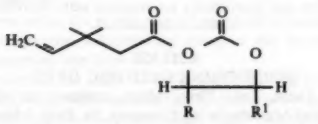
1. A compound corresponding to formula II



(II)

wherein X and Y are each independently halo, C_1 to C_4 perhaloalkyl, C_1 to C_4 alkyl, —CN, $—CO_2R''$ or $—CONR''_2$, wherein R'' at each occurrence is C_1 to C_4 alkyl, with the proviso that at least one of X or Y is halo or perhaloalkyl, Q and Z are each independently —Br or —Cl, and R and R^1 are each independently hydrogen, C_1 to C_4 alkyl, phenyl, benzyl or $—CH_2CH_2SCH_3$.

17. A compound corresponding to the formula V



(V)

wherein R and R^1 are each independently —H, C_1 to C_4 alkyl, phenyl, benzyl or $—CH_2CH_2SCH_3$.

4,515,957

PURIFICATION OF MERCAPTOBENZOTHIAZOLE

Chong-Kuang Shaw, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 20, 1982, Ser. No. 410,170

Int. Cl.³ C07D *277/72*

U.S. Cl. 548—177 **12 Claims**

1. In a process for purification of crude 2-mercaptobenzothiazole (MBT) which comprises dissolving crude MBT in an aqueous alkali metal hydroxide solution in a reactor by adding the alkaline solution to the crude MBT, and agitating contents of the reactor until essentially all MBT is converted to the MBT salt, the improvement comprising measuring pH of the salt solution when addition of the alkaline solution is made during which time an abrupt rise in pH takes place that follows a period of gradual pH increase, and stopping addition of the alkaline solution in response to the abrupt rise in pH in order to limit addition of the excess alkali metal hydroxide to about 5% or less.

4,515,958

PROCESS FOR PREPARING 1-ALKYL-5-MERCAPTOTETRAZOLES

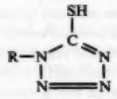
Ming Shen, Guilford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Jul. 25, 1983, Ser. No. 517,103

Int. Cl.³ C07D *257/04*

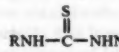
U.S. Cl. 548—251 **11 Claims**

1. A process for making 1-alkyl-5-mercaptotetrazoles of the formula:



wherein R is an alkyl group having 1 to 6 carbon atoms, comprising the steps of:

(a) reacting (i) the corresponding 4-alkylthiosemicarbazide of the formula:



wherein R is defined above with (ii) a base of the formula:

MB

wherein M is a metal cation selected from the group consisting of alkali metal cations and, B is selected from the group consisting of a hydroxide or an alkoxide and with (iii) an alkyl nitrite of the formula:

R_1ONO

wherein R_1 is an alkyl group having 1 to 8 carbon atoms to form a reaction mixture comprising the metal salt of 1-alkyl-5-mercaptotetrazole; and

(b) contacting said reaction mixture with sufficient acid to convert at least a major portion of said metal salt of said 1-alkyl-5-mercaptotetrazole into free 1-alkyl-5-mercaptotetrazole.

4,515,959

BIOLOGICALLY ACTIVE AMIDES

Ian T. Kay, Wokingham, and Robert A. Noon, Maidenhead, both of England, assignors to Imperial Chemical Industries PLC, London, England

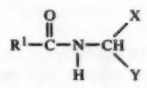
Filed Aug. 17, 1982, Ser. No. 408,894

Claims priority, application United Kingdom, Sep. 30, 1981, 8129521

Int. Cl.³ C07D *231/12, 249/08, 257/04, 405/12*

U.S. Cl. 548—378 **5 Claims**

1. Amide compounds of the formula (I)



(I)

wherein R^1 is (a) a phenyl group optionally substituted by one or more halogen atoms, cyano groups, alkoxy groups, methylene- or ethylene-dioxy groups, alkyl groups, or haloalkyl groups; or (b) a furyl or thiophenyl group optionally substituted by one or more alkyl groups, haloalkyl groups or halogen atoms; X is a pyrazolyl, tetrazolyl or 1,2,4-triazolyl radical linked by a ring nitrogen atom to the carbon atom bearing Y, and optionally substituted by one or more alkyl groups, and Y is a CN group; a $—CSNH_2$ group; or an amide group $—CONR^5R^6$ wherein each of R^5 and R^6 may be a hydrogen

atom or an alkyl radical, each alkoxy, alkyl and haloalkyl referred to above containing from 1 to 6 carbons.

4,515,960

SPIRO-2-AZA-ALKANE-3-CARBONITRILES, THEIR PREPARATION AND THEIR USE

Volker Teetz, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

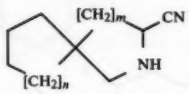
Filed May 16, 1983, Ser. No. 494,983

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218540

Int. Cl.³ C07D *221/20, 223/32, 223/14, 225/06*

U.S. Cl. 548—408 **2 Claims**

1. Compound of the formula I



(I)

in which m is an integer of from 1 to 3 and n is an integer of from 1 to 4.

4,515,961

RESOLUTION OF (±)-1,8-DIETHYL-1,3,4,9-TETRAHYDROPYRANO[3,4-b] INDOLE-1-ACETIC ACID USING ENRICHMENT CRYSTALLIZATION

Christopher A. Demerson, Montreal, and Leslie G. Humber, Dollard-des-Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,986

Int. Cl.³ C07D *498/04*

U.S. Cl. 548—432 **3 Claims**

1. A process for preparing (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid, which comprises allowing a solution of benzene-petroleum ether or toluene-petroleum ether containing an enantiomeric mixture of (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole]-acetic acid having at least 70 percent of (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid to crystallize, and collecting substantially pure (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid.

3. A process for preparing (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid, which comprises dissolving one part by weight of an enantiomeric mixture of (+)- and (−)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid having at least 70 percent of (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid in about 4 to 5 parts by weight of toluene or benzene at about 50° to 100° C.; adding about 6 to 7 parts by weight of petroleum ether; seeding the solution with (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid; allowing the solution to crystallize for about one to four hours; and isolating substantially pure (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid.

4,515,962

ALLYL OR METHALLYL-BICYCLO[2.2.1]HEPT-5-ENE-2,3-DICARBOXYLIC ACID IMIDES AND BISIMIDES

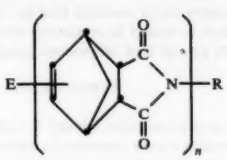
Alfred Renner, Muntelier, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jul. 25, 1983, Ser. No. 517,096

Int. Cl.³ C07D *209/94*

U.S. Cl. 548—435 **7 Claims**

1. An imide of the formula I



(I)

in which E is allyl or methallyl, n is 1 or 2 and, if n is 1, R is hydrogen, alkyl having 1–12C atoms, alkenyl having 3–6C atoms, cycloalkyl having 5–8C atoms, phenyl, tolyl, xylyl or naphthyl, or benzyl or, if n is 2, R is $-C_mH_{2m}-$, in which m=2–20, m-phenylene, p-phenylene, 1,3-naphthylene, 1,4-naphthylene or 1,5-naphthylene group having 6–10C atoms or a group of the formula II

(II)

in which T is methylene, isopropylidene, CO, O, S or SO_2.

4,515,963

PROCESS FOR PRODUCING 1,8-NAPHTHOLACTAM COMPOUNDS

Rainer Begrich, Rheinfelden, Switzerland, assignor to Ciba Geigy AG, Basel, Switzerland

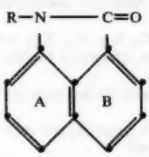
Filed Jan. 14, 1983, Ser. No. 458,394

Claims priority, application Switzerland, Jan. 22, 1982, 407/82

Int. Cl.³ C07D *487/00*

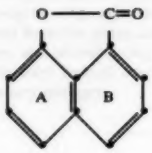
U.S. Cl. 548—437 **5 Claims**

1. A process for producing a 1,8-naphtholactam compound of the formula I



(I)

wherein R is hydrogen; a C_1–C_4-alkyl group optionally substituted by C_1–C_4-alkoxy, halogen, OH, CN, COOH, CON(alkyl C_1–C_4)$_2$ or phenyl; a cycloalkyl group or a phenyl group optionally substituted by halogen, C_1–C_4-alkyl, CN, C_1–C_4-alkoxy, COOH, CON(alkyl C_1–C_4)$_2$ or SO_2N-(alkyl C_1–C_4)$_2$, and the benzo rings A and/or B are unsubstituted or substituted once or several times by halogen, CN, NO_2, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-phenylsulfonyl, arylsulfonyl, alkyl(C_1–C_4)-carbamoylamino, benzoylamino, COOH, COO-alkyl(C_1–C_4), $CONH_2$, CONH(C_1–C_4-alkyl), CON(C_1–C_4-alkyl)$_2$, SO_2NH_2, SO_2NH(C_1–C_4-alkyl) or SO_2N(C_1–C_4-alkyl)$_2$, which process comprises reacting a 1,8-naphtholactone compound of the formula II


(II)

with an amine of the formula III

$$NH_2—R \quad \text{(III)},$$

optionally in the presence of bisulfite.

4,515,964

POLYHALOPHTHALIMIDOALKYL-FUNCTIONAL CARBONATES

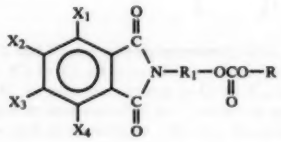
Nicodemus E. Boyer, Schaumburg, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 337,660, Jan. 7, 1982, Pat. No. 4,414,396. This application Apr. 25, 1983, Ser. No. 488,462

Int. Cl.³ C07D *209/48, 403/12*

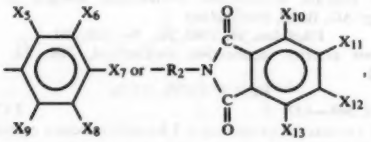
U.S. Cl. 548—463 **16 Claims**

1. A compound represented by the structural formula:


(I)

wherein

a. R is



b. R_1 and R_2 are each independently straight chain or branched alkylene having from about 2 to about 5 carbon atoms, and

c. X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, and X_{13} are each independently hydrogen, chloro or bromo, with the provisos that:

(1) at least three of X_1, X_2, X_3, and X_4 are each independently chloro or bromo,

(2) at least three of X_5, X_6, X_7, X_8, and X_9 are each independently chloro or bromo, and

(3) at least three of X_{10}, X_{11}, X_{12}, and X_{13} are each independently chloro or bromo.

4,515,965

PROCESS FOR PREPARING MALEIMIDE

Stephen S. Hupp, Dublin, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 10, 1984, Ser. No. 579,063

Int. Cl.³ C07D *207/448*

U.S. Cl. 548—548 **7 Claims**

1. A process for the preparation of maleimide consisting essentially of subjecting a mixture of succinimide, air and water to oxidative dehydrogenation at a temperature in the range of from 300° to 550° C. over a catalyst having the formula $FeP_xMe_yO_z$ wherein Me is one of more of the elements Li, Na, K, Rb, Cs, Mg, Ca, Sr and Ba; x is from 0.2–3.0; y is from 0–2 and z is the value corresponding to average valences of the elements in the oxidation states in which they exist in the catalyst.

4,515,966

4,5-DIMETHYL-2-(2-METHYLTHIO)ETHYL)-1,3-OXATHIOLANE

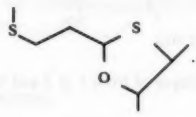
Alan O. Pittet, Atlantic Highlands; Thomas F. Courtney, Jr., Oakhurst, and Ranya Muralidhara, Fair Haven, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,747

Int. Cl.³ C07D *327/04*

U.S. Cl. 549—30 **1 Claim**

1. 2-[2-(methylthio)ethyl]-1,3-oxathiolane having the structure:



4,515,967

METHYL(METHYLTHIOALKYL)-1,3-DITHIOLANES

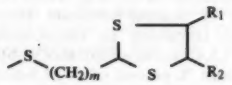
Alan O. Pittet, Atlantic Highlands; Thomas F. Courtney, Jr., Oakhurst, and Ranya Muralidhara, Fair Haven, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,748

Int. Cl.³ C07D *339/06*

U.S. Cl. 549—39 **4 Claims**

1. A compound defined according to the structure:



wherein R_1 and R_2 are the same or different and each represents methyl or hydrogen with a proviso that at least one of R_1 and R_2 is methyl; and wherein m represents an integer of 1 or 2 and with the further proviso that when m is 1, then both R_1 and R_2 are methyl.

4,515,968

FURYL AND PHENYL MERCAPTALS AND USE THEREOF IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS

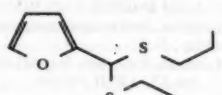
Alan O. Pittet, Atlantic Highlands; Thomas F. Courtney, Jr., Oakhurst, and Ranya Muralidhara, Fair Haven, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 12, 1983, Ser. No. 541,151

Int. Cl.³ C02D *333/00;* **A23C** *3/00*

U.S. Cl. 549—39 **3 Claims**

1. The mercaptal having the structure:

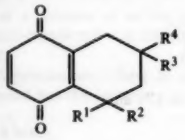


4,515,969
CYCLIC COMPOUNDS

Michael J. Broadhurst, Baldock; Cedric H. Hassall, Welwyn, and Gareth J. Thomas, Luton, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

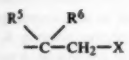
Continuation of Ser. No. 312,579, Oct. 19, 1981, abandoned, Division of Ser. No. 111,348, Jan. 11, 1980, Pat. No. 4,316,985. This application Jan. 23, 1984, Ser. No. 573,260
Claims priority, application United Kingdom, Jan. 16, 1979, 7901537; Jul. 26, 1979, 7926151
Int. Cl.³ C07D *339/06, 317/26, 50/10*
U.S. Cl. 549—39 9 Claims

1. The compound of the formula



V

wherein one of R^1 and R^2 represents a hydrogen atom and the other represents a hydroxy group R^3 represents a hydroxy group and R^4 represents a lower alkyl or loweralkoxycarbonyl or benzyloxycarbonyl group or a group of the formula



a

in which R^5 and R^6 together form an oxo group or an ethylene ketal or ethylene thio ketal group and X represents a hydrogen atom or a hydroxy or lower alkanoyloxy group, or

$$-(CH_2)_n-OY \qquad b$$

in which n stands for 1 or 2 and Y represents a hydrogen atom or an alkyl or lower alkanoyl group.

4,515,970
PROCESS FOR PREPARATION OF ALKANOIC ACIDS

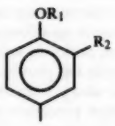
Yani Christidis, and Jean-Claude Vallejos, both of Paris, France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Apr. 17, 1984, Ser. No. 601,221
Claims priority, application France, Apr. 29, 1983, 83 07137
Int. Cl.³ C07D *333/24;* C07C *63/36*
U.S. Cl. 549—79 10 Claims

1. A process for preparation of substituted acetic acids having the general formula I:

$$Ar-CHR-COOH \qquad I$$

in which R is selected from the group consisting of one hydrogen atom and C_1–C_4-alkyl radicals, and Ar is selected from the group consisting of radicals of aromatic nature selected from the following radicals: 2-thienyl, 2-methoxy-1-naphthyl, 3,4-methylenedioxy-phenyl, and the substituted phenyls of the general formula II:

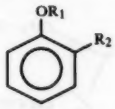


II

where R_1 is selected from the group consisting of hydrogen and C_1–C_4-alkyl groups, and R_2 is selected from the group consisting of hydrogen, halogen, alkyl, alkoxy and hydroxy-groups, such process comprising the step of reacting under heat in an acid medium, in the presence of red phosphorus and catalytic quantities of iodine or hydriodic acid, an alpha carbonylated carboxylic acid having the general formula III:

$$R-CO-COOH \qquad III$$

in which R has the same meaning as above with an unsaturated derivative of aromatic nature selected from the group consisting in thiophene, 2-methoxynaphthalene, 1,2-methylenedioxybenzene, and the substituted aromatic hydrocarbons having the general formula IV:



IV

in which R_1, R_2 have the same meanings as above.

4,515,971
5'/6'-CARBOXYFLUORANS AND DERIVATIVES THEREOF

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Hilton-Davis Chemical Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 135,855, Mar. 31, 1980, Pat. No. 4,298,215, which is a continuation-in-part of Ser. No. 39,017, May 14, 1979, Pat. No. 4,274,660. This application Jul. 6, 1981, Ser. No. 281,027
Int. Cl.³ C07D *311/86*
U.S. Cl. 549—225 7 Claims

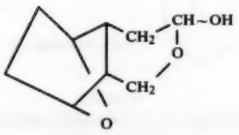
1. 2-Anilino-3-methyl-6-diethylamino5'/6'phenylmethoxycarbonylfluoran.

4,515,972
INTERMEDIATES AND METHOD FOR PRODUCING INTERMEDIATES USEFUL IN THE PREPARATION OF 7-OXABICYCLOHEPTANE PROSTAGLANDIN DERIVATIVES

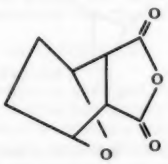
Jagabandhu Das, Plainsboro, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 19, 1983, Ser. No. 543,564
Int. Cl.³ C07D *493/08, 307/77*
U.S. Cl. 549—229 17 Claims

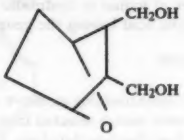
1. A method for preparing a hemiacetal of the structure



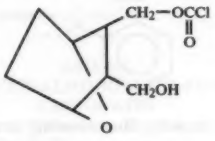
which comprises reducing a dione (mesoanhydride) of the structure



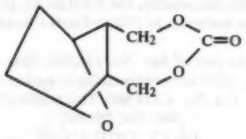
to form a diol of the structure



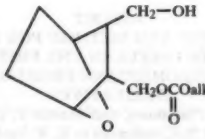
chloroformylating the diol by reacting same with phosgene to form the alcohol of the structure



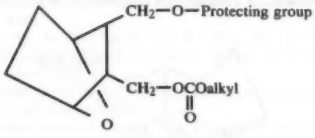
reacting the alcohol with pyridine to form the cyclic carbonate of the structure



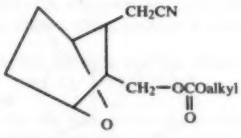
reacting the cyclic carbonate with an alkanol to form an alcohol of the structure



reacting the alcohol with a protecting compound containing a sulfonyl group to form the protected alcohol of the structure

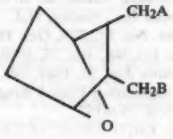


wherein "Protecting group" contains a sulfonyl moiety, reacting the protected alcohol with a cyanide to form the cyanocarbonate of the structure



and reducing the cyano carbonate to form the hemiacetal.

9. An intermediate for use in preparing 7-oxabicycloheptane prostaglandin derivatives, said intermediate having the structure



wherein

A is

OH, O-Protecting group, or CN and

B is OH where A is

and B is

wherein A is OH, O-Protecting group or CN and wherein "Protecting group" contains a sulfonyl moiety.

4,515,973

PROCESS FOR PRODUCING MALEIC ANHYDRIDE

James T. Wrobleski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1983, Ser. No. 566,378

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—259 **26 Claims**

1. A process for the production of maleic anhydride by the oxidation of a nonaromatic hydrocarbon having at least four carbon atoms in a straight chain with molecular oxygen or a molecular oxygen containing gas in the vapor phase at a temperature from abut 300° C. to about 600° C. in the presence of a phosphorus-vanadium mixed oxide catalyst wherein the catalyst is prepared by:

(a) contacting a tetravalent vanadium compound, dissolved in an aqueous, non-oxidizing acid medium, with crystalline diphosphoric acid to form a phosphorus-vanadium mixed oxide catalyst precursor;

(b) crystallizing the catalyst precursor from the catalyst precursor aqueous solution in a controlled manner involving at least three cycles of concentrating/diluting wherein a fraction of the liquid from about 0.15 to about 0.85 is removed during the concentrating step and water is added during the diluting step in an amount sufficient to provide a water added/solvent removed volume ratio from about 0.10 to about 10.0, with the proviso that the final liquid-/initial liquid volume ratio is from about 0.20 to about 2.0;

(c) recovering the catalyst precursor crystals;

(d) drying the catalyst precursor;

(e) forming the dried catalyst precursor into structures, and

(f) calcining the catalyst precursor structures at a temperature from about 300° C. to about 600° C.

4,515,974

PROCESS FOR THE PREPARATION OF FUMARIC ACID MONOESTERS

Wilfried Zecher, and Rudolf Merten, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,037

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127432

Int. Cl.³ C07C *67/08, 69/60;* **C07D** *319/02, 319/04, 319/12, 307/46*

U.S. Cl. 549—372 **19 Claims**

1. A process for the preparation of a fumaric acid monoester which comprises contacting in the presence of a cis-trans catalyst an unsubstituted or substituted maleic anhydride in the form of a solution or in the form of a melt thereof with a hydroxyl compound at a temperature in the range of 100° C. to 220° C.

6. A process according to claim 1, wherein the hydroxyl compound has the formula

$$R^3(OH)_n \qquad (II)$$

in which

R^3 denotes alkyl, alkenyl, alkinyl, aralkyl, aryl, cycloalkyl, a 5-membered or 6-membered heterocyclic radical having 1 or 2 oxygen or nitrogen atoms, or the radical of a polyether, polyester, polyurea, polyurethane, polyimide or polyhydantoin and

n represents one of the numbers 1, 2 or 3.

14. A process according to claim 6, wherein said 5-membered or 6-membered heterocyclic radical having 1 or 2oxygen atoms is furan or dioxane.

4,515,975

CHROMAN DERIVATIVES AND THEIR PREPARATION

Friedrich Vogel, Wachenheim, and Joachim Paust, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 315,856, Oct. 28, 1981, abandoned. This application Nov. 4, 1982, Ser. No. 439,625

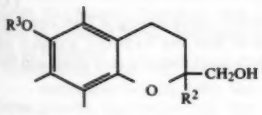
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044109

Int. Cl.³ C07D *311/22*

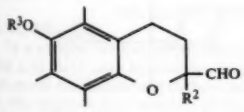
U.S. Cl. 549—411 **2 Claims**

1. A process for the preparation of a 2-hydroxy-methylchroman or a 2-formylchroman of the formula IIa or IIb

IIa



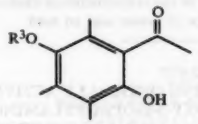
IIb



where R^2 is C_1–C_4-alkyl and R^3 is hydrogen or a protective group, which comprises

(a) reacting acetyl-trimethylhydroquinone IV

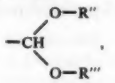
IV



with a ketone of the formula V

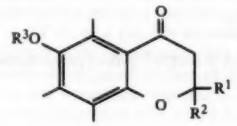
$$R^2—CO—R^1 \qquad V$$

where R^1 is $—CH_2—O—R'$ or



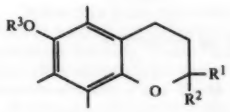
where R′ is C_1–C_4-alkyl or arylmethyl and R″ and R‴ are each C_1–C_4-alkyl, which can also be bonded to form a five-membered or six-membered cyclic acetal, in the presence of an optically active amine to give a chroman derivative Id

Id



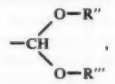
(b) hydrogenating Id under dehydrating conditions to give Ia

Ia



and

(c) converting R^1 in Ia to hydroxymethyl, if R^1 is $—CH_2—O—R'$, or to formyl, if R^1 is



by hydrolysis or hydrogenolysis.

4,515,976

METHOD FOR PREPARING ASYMMETRICAL DISILOXANES

Gerhard Preiner, and Johann Müller, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 578,389

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312737

Int. Cl.³ C07F *7/08*

U.S. Cl. 556—453 **8 Claims**

1. A method for preparing asymmetrical disiloxanes which comprises reacting (a) a silane having three SiC-bonded monovalent organic radicals of which at least one may be substituted with Si-bonded hydrogen and an SiOC-bonded monovalent organic radical with (b) a symmetrical disiloxane which is

different from the disiloxane obtained from the hydrolysis of silane (a) in which at least two of the substituents of disiloxane (b) are the same in the presence of water and an acid.

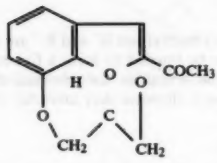
4,515,977

PROCESS FOR PREPARING OPTICALLY ACTIVE [S]-2-ACETYL-7-(2-HYDROXY-3-ISOPROPYLAMINO-PROPOXY)BENZOFURAN AND SALTS THEREOF

Jun Nakano, Moriyama; Teruo Nakanishi, Kyoto, and Kazuhiko Kimura, Otsu, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

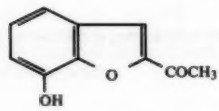
Filed Mar. 16, 1983, Ser. No. 475,925
Claims priority, application Japan, Mar. 16, 1982, 57-42145
Int. Cl.³ C07D *307/86*
U.S. Cl. 549—468 **2 Claims**

1. A process for preparing [S]-2-acetyl-7-(2,3-epoxypropoxy)benzofuran of the following formula:



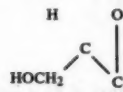
which comprises subjecting 2-acetyl-7-hydroxybenzofuran of the formula (I):

(I)



and [R]-glycidol of the formula (II):

(II)



to redox dehydration condensation in an inert organic solvent in the presence of triphenylphosphine and a dialkyl azodicarboxylate.

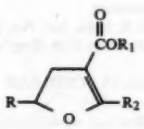
4,515,978

DIHYDROFURANS

Eugene G. Harris, West Chester, and Richard G. Fayter, Jr., Fairfield, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,974
Int. Cl.³ C07D *307/28*; A61K *7/46*
U.S. Cl. 549—484 **6 Claims**

1. A compound of the formula



wherein R is vinyl, R_1 is a C_{1-4} alkyl group and R_2 is a C_{3-8} alkyl or alkenyl group.

6. 4-Carbethoxy-5-phenyl-2-vinyl-2,3-dihydrofuran.

4,515,979

PREVENTION OF ODORS IN POLYORGANOSILOXANES

Masaaki Otsuki, and Shinji Kida, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 622,937
Claims priority, application Japan, Jul. 11, 1983, 58-124669
Int. Cl.³ C07C *7/04*
U.S. Cl. 556—445 **5 Claims**

1. A process for preventing odor in a polyoxyalkylene group-containing polyorganosiloxane comprising adding phytic acid to the polyoxyalkylene group-containing polyorganosiloxane during and/or after its production.

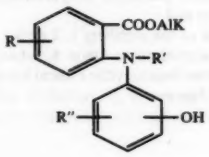
4,515,980

SUBSTITUTED AMINOBENZOATES, THEIR PREPARATION AND USE

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,843
Int. Cl.³ C07C *101/72*
U.S. Cl. 560—45 **4 Claims**

1. A compound of the formula



wherein:
R is lower-alkoxy;
R′ is hydrogen or lower-alkyl;
R″ is hydrogen, lower-alkyl or halo; and
Alk is lower-alkyl.

4. Ethyl 2-(4-hydroxyphenylamino)benzoate.

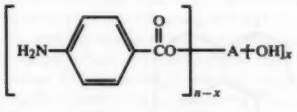
4,515,981

POLYETHERPOLYOL DERIVATIVE AND PROCESS FOR PREPARING THE SAME

Kozo Otani, Hyogo, and Yoshio Yamada, Osaka, both of Japan, assignors to Toyo Tire & Rubber Company, Limited, Japan

Filed Sep. 20, 1983, Ser. No. 533,871
Claims priority, application Japan, Sep. 21, 1982, 57-165447
Int. Cl.³ C07C *101/56*
U.S. Cl. 560—50 **1 Claim**

1. A polyetherpolyol derivative having at least one terminal amino group in which at least one hydroxyl group is substituted by a residue of para-aminobenzoic acid ester, and having the formula



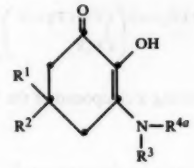
wherein n is an integer of 2 to 8, x is a positive number of 0.05n to (n−1), A is an n-valent radical obtained by removal of hydroxyl groups from an n-valent polyoxyalkylenepolyol having a molecular weight of 400 to 10,000.

4,515,982
AMINOREDUCTONES

Peter Lechtken, Frankenthal; Gerhard Mueller, Germersheim, and Klaus Schmieder, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 15, 1982, Ser. No. 450,097
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151534
Int. Cl.³ C07C *101/12*; C07D *265/36*
U.S. Cl. 560—125 8 Claims

1. An aminoreductone of the formula Ia



Ia

where

R^1, R^2 and R^3 are H, methyl or ethyl, and

R^{4a} is the radical, bonded to a primary amino group, selected from the group consisting of a naturally occurring α- or β-amino acid, a C_1 to C_{10}-alkyl ester thereof, and, in the case of an α-amino acid a radical in which the carboxyl group of the amino acid and the 2-hydroxyl group of the cyclohexenone ring form a lactone, 2-hydroxy-C_2 to 10-alkyl, C_1 to C_{20}-alkenyl, which hydroxy alkyl groups may carry a C_1 to C_4-alkoxy, or C_1 to C_2-acyloxy group, or a $-(CH_2-CH_2-O)_nH$ group where n is 2 to 10 which group may be etherified with a C_1 to C_4-alkanol or esterified with a C_1 to C_4-fatty acid, or a mineral salt thereof.

4,515,983
MANUFACTURE OF PHENYL ESTERS AND PHENOL

Anil B. Goel, Worthington, and Michael E. Pettiford, Dublin, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 30, 1983, Ser. No. 509,476
Int. Cl.³ C07C *27/14, 39/04, 69/157, 69/22*
U.S. Cl. 560—130 9 Claims

1. A process for preparing phenyl esters and phenol consisting essentially of reacting in the vapor phase a feed of benzene, molecular oxygen and a carboxylic acid in the presence of a palladium carboxylate, an antimony carboxylate and a chromium carboxylate wherein the carboxylic acid and the carboxylates are the same and have from 2 to 6 carbon atoms at a temperature in the range of from 140° C. to 350° C. and at about atmospheric pressure.

4,515,984
PROCESS FOR THE PREPARATION OF ALKALI-METAL FORMYL ACID ESTERS

Moustafa El-Chahawi, Troisdorf, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 217,597, Dec. 18, 1980,. This application Sep. 20, 1982, Ser. No. 419,898
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952070
Int. Cl.³ C07C *67/36*
U.S. Cl. 560—183 11 Claims

1. In a process for the preparation of an alkali metal formyl acetic acid alkyl ester by reaction of acetic acid alkyl ester, an alkali-metal alcoholate and carbon monoxide at elevated pressure, the improvement wherein at least 1.2 mols of acetic acid alkyl ester per mol of alkali metal alcoholate is employed, the reaction mixture consists essentially of said acetic acid alkyl ester, alkali metal alcoholate and carbon monoxide, the reaction is conducted at a temperature of 10° to 100° C. and the reaction is carried out in the absence of a substantial amount of added solvent.

4,515,985
PREPARATION OF CHLORINATED PHENOXYALKANOIC ACIDS

Gerd Husslein, Bad Durkheim; Gerhard Hamprecht, Weinheim; Karl-Heinz Koenig, Frankenthal; Walter Boehm, Kirchheim, and Manfred Gaeng, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,457
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049541
Int. Cl.³ C07C *59/56*
U.S. Cl. 562—472 2 Claims

1. A process for the preparation of 2,4-dichloro- or 2-methyl-4-chlorophenoxyacetic acid or α-2,4-dichloro- or α-2-methyl-4-chlorophenoxypropionic acid by reacting phenoxyacetic or 2-methylphenoxyacetic acid or α-phenoxypropionic or α-2-methylphenoxypropionic acid with chlorine in water, wherein phenoxyacetic or 2-methylphenoxyacetic acid or α-phenoxypropionic or α-2-methyl-phenoxypropionic acid is precipitated from an aqueous solution thereof, chlorine gas is passed into the resulting suspension of the acid in water at from 30° to 70° C. at a rate not exceeding the rate at which it is consumed in the suspension, until from 100 to 110% of the theoretically required amount of chlorine gas has been taken up by the suspension, and the 2,4-dichloro- or 2-methyl-4-chlorophenoxyacetic acid or α-2,4-dichloro- or α-2-methyl-4-chloro-phenoxypropionic acid is isolated from the suspension.

4,515,986
PROCESS FOR PREPARING 3-DIMETHYLAMINO-2,2-DIMETHYLPROPANAL

Wolfgang Bernhagen, Mülheim; Volker Falk, Oberhausen; Helmut Springer, Oberhausen; Jürgen Weber, Oberhausen; Ernst Wiebus, Oberhausen, and Claus Kniep, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,114
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031248
Int. Cl.³ C07C *85/00, 85/18*
U.S. Cl. 564—471 11 Claims

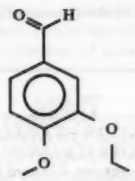
1. In a process for preparing 3-dimethylamino-2,2-dimethylpropanal from isobutyraldehyde, dimethylamine and a source of formaldehyde at 80° to 120° C., the improvement wherein the reaction is carried out at a pH-value of 9 to 11.

4,515,987
PROCESS FOR PREPARING A METHOXYBENZALDEHYDE FROM THE CORRESPONDING PHENOLIC BENZALDEHYDE

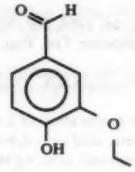
Richard M. Boden, Ocean; Theodore J. Tyszkiewicz, Sayreville; Michael Licciardello, Farmingdale; Manfred H. Vock, Locust; Joaquin F. Vinals, Rumson; Patrick Whalen, Matawan, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 496,568, May 20, 1983, abandoned, which is a division of Ser. No. 384,924, Jun. 4, 1982, abandoned. This application Jun. 26, 1984, Ser. No. 624,757
Int. Cl.³ C07C *45/61*
U.S. Cl. 568—433 1 Claim

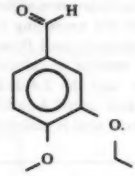
1. The process for preparing the compound having the structure:



comprising the step of reacting the compound having the structure:



with methyl chloroformate at reflux conditions in the presence of a phase transfer agent and a base and in the presence of an inert solvent for such a period of time as to convert the entire reaction product to the compound having the structure:



4,515,988

HERBICIDAL 4-TRIFLUOROMETHYL-4'-NITRODIPHENYL ETHERS

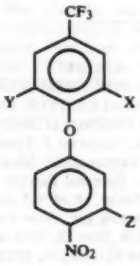
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 939,086, Sep. 1, 1978, Pat. No. 4,350,522, which is a division of Ser. No. 808,415, Jun. 20, 1977, Pat. No. 4,185,995, which is a division of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, which is a division of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Sep. 16, 1981, Ser. No. 302,916

Int. Cl.³ C07C *43/263*

U.S. Cl. 568—586 **4 Claims**

1. A compound of the formula



wherein

X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C_1–C_4)alkyl group,

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a hydroxy group.

4,515,989

PREPARATION DECARBOXYLATION AND POLYMERIZATION OF NOVEL ACID FLOURIDES AND RESULTING MONOMERS

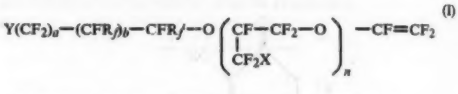
Bobby R. Ezzell, Lake Jackson; William P. Carl, Angleton, and William A. Mod, Lake Jackson, all of, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 11, 1980, Ser. No. 158,426

Int. Cl.³ C07C *41/01, 41/18*

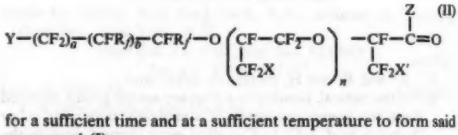
U.S. Cl. 568—674 **19 Claims**

1. In a method of preparing a compound of the formula



(I)

which comprises reacting a compound of the formula



(II)

for a sufficient time and at a sufficient temperature to form said compound (I);

where

a=is 0 or an integer greater than 0;

b=is 0 or an integer greater than 0;

R_f and R'_f are independently selected from the group consisting of F, Cl, perfluoroalkyl radicals and fluorochloroalkyl radicals;

X=F, Cl, Br, or mixtures thereof when n>1;

X'=Cl or Br;

n=0 or an integer greater than 0;

Z=F, OH, NRR' or OA, Cl, Br;

A=alkali metal, quaternary nitrogen, or R;

R and R' are independently selected from the group consisting of hydrogen, an alkyl having more than one carbon atom and an aryl;

Y=I, Br, Cl or F.

4,515,990

PREPARATION OF INDANES, TETRALINS AND PHENYL ALCOHOL IN FRIEDEL CRAFT REACTION

John G. Ferber, Essex; Peter J. Goddard, and Robert S. Holden, both of Cheshire, all of England, assignors to Bush Boake Allen Limited, London, England

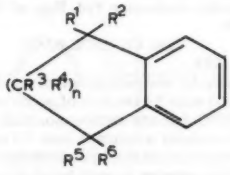
PCT No. PCT/GB83/00074, § 371 Date Nov. 7, 1983, § 102(e) Date Nov. 7, 1983, PCT Pub. No. WO83/03247, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 11, 1983, Ser. No. 555,876

Claims priority, application United Kingdom, Mar. 12, 1982, 8207229

Int. Cl.³ C07C *33/34*

U.S. Cl. 568—808 **21 Claims**



1. In a process for reacting a starting aromatic compound selected from the group consisting of indanes, tetralins, ben-

zylic halides, 1-halo-2-aryl-alkanes, tertiary alkyl-substituted compounds, benzene and C_{1-4}alkyl-substituted benzenes with a Friedel Craft reactant selected from the group consisting of ethylene oxide and propylene oxide when the aromatic compound is selected from indanes, tetralins, benzene and alkyl-substituted benzenes; from the group consisting of acetyl chloride and acetic anhydride when the aromatic compound is selected from indanes and tetralins; and from the group consisting of alkenes when the aromatic compound is selected from benzylic halides, 1-halo-2-aryl-alkanes and tertiary alkyl-substituted compounds to form an end product selected from indanes, tetralins and phenyl alcohols by a heterogeneous exothermic Friedel Craft reaction in a reaction mixture that contains a Friedel Craft catalyst and a solvent for the reaction and that is cooled to a temperature at which substantial by-product formation is avoided and that is below 40° C., the improvement which comprises; in that cooling of the reaction mixture throughout the reaction is solely or mainly effected, and local over heating in the reaction mixture is substantially prevented, by continuously utilizing the heat of reaction to boil solvent from the reaction mixture.

4,515,991

ELECTRIC CABLE GLANDS

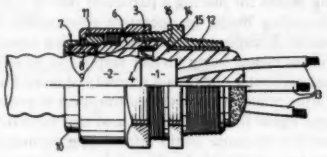
John B. Hutchison, Kingsley, England, assignor to BICC Public Limited Company, London, England

Filed Apr. 5, 1983, Ser. No. 482,144

Claims priority, application United Kingdom, Apr. 22, 1982, 8211669

Int. Cl.³ H02G 3/06

U.S. Cl. 174—65 SS 5 Claims



1. A cable gland comprising:

two tubular members each having a wider end and a narrower end and telescopically engageable at their respective wider ends to define, when a cable end is inserted through the telescoped members, an annular chamber around said cable ends, said chamber containing a hard setting compound in pasty or viscous condition;

means for urging said tubular members axially together to reduce the volume of said annular chamber and pressurize said hard setting compound;

and at least one resilient contact finger in electrical continuity with and projecting inwardly from one of said tubular members.

4,515,992

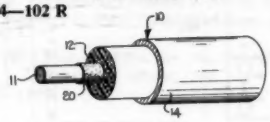
CABLE WITH CORROSION INHIBITING ADHESIVE

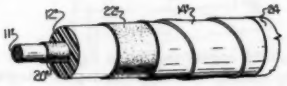
Chakra V. Gupta, Hickory, N.C., assignor to CommScope Company, Catawba, N.C.

Filed May 10, 1983, Ser. No. 493,375

Int. Cl.³ H01B 7/28

U.S. Cl. 174—102 R 18 Claims





10. A coaxial cable comprising

an inner conductor having an outer surface of copper,

a polymer dielectric material surrounding said inner conductor,

a tubular metallic sheath surrounding said polyolefin dielectric, and

a thin adhesive coating provided at the interface between said inner conductor and said dielectric, said coating comprising an amino functional silane reacted with the copper surface of said inner conductor to provide corrosion resistance thereto, and a polymer having linear hydrocarbon segments adhering to said dielectric and to said inner conductor and promoting adhesive bonding therebetween.

13. In a method of producing a cable of the type having at least one metallic inner conductor, a dielectric material surrounding the at least one inner conductor, and a metallic outer conductor surrounding the dielectric material and the at least one inner conductor, the improvement which comprises applying at the interface between at least one of said conductors and the dielectric an adhesive coating composition comprising a polyfunctional organosilane compound, said polyfunctional organosilane compound including organofunctional groups selected from the group consisting of amino, aminoalkyl, chloroalkyl, mercapto, vinyl, epoxy and methacryate, and reacting the polyfunctional organosilane compound with the metallic surface of the conductor to provide corrosion resistance thereto and to promote bonding between the conductor and the dielectric.

4,515,993

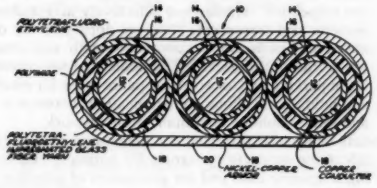
LOW PROFILE SUBMERSIBLE ELECTRICAL CABLE

Burton T. MacKenzie, Lawrence, Kans., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 16, 1984, Ser. No. 571,315

Int. Cl.³ H01B 7/18, 7/28

U.S. Cl. 174—102 R 11 Claims



1. A multi-conductor electrical cable for use in a high temperature and high pressure corrosive environment, said cable comprising:

a plurality of electrical conductors sheathed in an array of separate layers of material comprising plastic materials proximate to the conductor and including outer layers of metal, at least the first of said proximate layers comprising a plastic insulating material having a high dielectric strength closely surrounding each conductor, a second of said proximate layers comprising a polymeric material which is mechanically and chemically stable to at least 400° F. closely jacketing said first layer by being directly extruded thereon, and an outer protective metal armor surrounding said plurality of insulated and jacketed electrical conductors.

4,515,994

COMBINATION ELECTRONIC ROAD GUIDANCE AND COMMUNICATION SYSTEM FOR VEHICLES

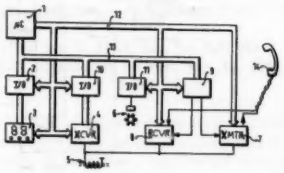
Günter Bolle, Diekholzen; Peter Brägas, Hildesheim-Itzum, and Bernd Eschke, Bad Salzdetfurth, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,532

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241022

Int. Cl.³ H04M 11/00

U.S. Cl. 179—2 R 16 Claims



1. In a system for guiding road vehicles respectively to destinations selected by their owners or drivers, comprising inductive transmitter/receiver installations including subsurface inductive field generating and sensing loops set at various

locations in roadways, said installations being connected together in a traffic information system, and inductive transmitter/receiver apparatus installed in road vehicles, connected to vehicle-mounted inductive field generating/sensing means and associated with means for entering selected destination indicia for transmission and means for displaying recieved information, said transmitter/receiver installations and apparatus being constituted so as to transmit and receive digitally encoded signals, the improvement of providing in said system, for built-in access from said road vehicles to a telephone communication network, apparatus comprising:

at least some of said roadway transmitter/receiver installations set in parking and/or roadside pause areas for exchange of signals with temporarily stationary vehicles and including modulated wave transmitter/receiver equipment connected to said subsurface loops and activateable to establish two-way connections with a telephone communication network;

modulated wave transmitter/receiver equipment in said road vehicle connected to said vehicle-mounted loops of the respective vehicles and selectively activatable to supersede said transmitter/receiver apparatus for digitally encoded signals and to cooperate with said modulated wave transmitter/receiver equipment of said installations set in parking and/or roadside pause areas for establishing and holding telephone communications between a vehicle and said telephone communication network,

means being also provided for generation and response to telephone supervisory signals for initiating and terminating telephone calls and for generation of selective calling signals in said vehicles for directing telephone calls,

and means responsive to vehicle motion for blocking activation of said modulated wave transmitter/receiver equipment while said vehicle is traveling.

4,515,995

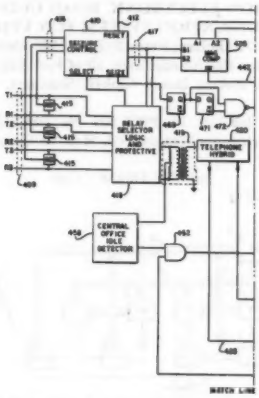
TELEPHONE ANSWERING MACHINE WITH APPARATUS FOR SELECTING PARTICULAR OUTGOING MESSAGE IN RESPONSE TO INCOMING CALL ON A PARTICULAR LINE

Fred C. Bolick, Jr., and Luther C. Plunkett, Jr., both of Atlanta, Ga., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 78,231, Sep. 24, 1979, Pat. No. 4,319,290, which is a continuation-in-part of Ser. No. 970,357, Dec. 18, 1978, Pat. No. 4,247,876. This application Aug. 3, 1981, Ser. No. 290,951

Int. Cl.³ H04M *1/64, 11/10;* **G11B** *31/00*

U.S. Cl. 179—6.13 **5 Claims**



1. Audio signal recording apparatus for recording and reproducing audio information from one of a plurality of telephone trunks including connecting means for establishing an audio connecting path between a set of record/playback electronics and one of said plurality of trunks in response to an incoming call on one of said plurality of trunks wherein the improvement comprises:

a record medium transport connected to said record/-playback electronics;

a plurality of discrete recording media;

control means responsive to said incoming call and said plurality of trunks for providing a first indexing signal corresponding to said one of said plurality of trunks in response to said incoming call;

indexing means for placing a particular one of said plurality of recording media in operative relationship with said transport in response to said first indexing signal;

said control means being further responsive to said placing of said particular one of said plurality of record medium in operative relationship with said transport to provide a first control signal to said transport and said record/playback electronics to cause audio information recorded on said particular one of said plurality of discrete recording media to be provided to said audio connecting path;

said control means being further responsive to a predetermined signal recorded on said particular one of said plurality of discrete recording media to provide a second indexing signal; and

said indexing means being further responsive to said second indexing signal to place a second particular one of said plurality of discrete record media in operative relationship with said transport.

4,515,996

TELEPHONE CIRCUIT

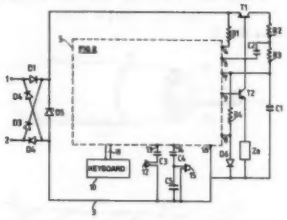
Kenneth N. Burgin, Swindon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 513,941

Claims priority, application United Kingdom, Aug. 25, 1982, 8224346

Int. Cl.³ H04M *1/76*

U.S. Cl. 179—81 B **6 Claims**



1. In telephone apparatus having an exchange battery, at least one subscriber telephone set having an integrated circuit and a subscriber line connecting said subscriber telephone set to said exchange battery so that said integrated circuit is powered thereby, whereby the energizing voltage for said integrated circuit varies in accordance with the length of said subscriber line, an improved subscriber telephone set comprising:

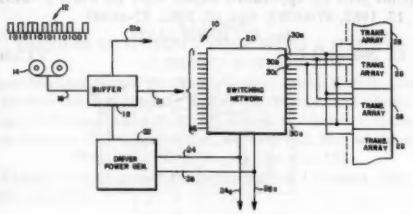
an earpiece amplifier and a microphone amplifier forming part of said integrated circuit, each of said amplifiers having an adjustable gain; and

automatic gain control means for controlling said adjustable gains of said microphone and earpiece amplifiers in accordance with said length of said subscriber's line, said automatic gain control means comprising means for generating a reference voltage, means for comparing said reference voltage to said energizing voltage and generating a control signal dependent on the difference therebetween, and means for applying said control signal to said microphone and earpiece amplifiers to control the gains thereof so that said gains increase with increases of said length of said subscriber's line.

4,515,997
DIRECT DIGITAL LOUDSPEAKER

Walter E. Stinger, Jr., 423 Anthwyn Rd., Narberth, Pa. 19072

Filed Sep. 23, 1982, Ser. No. 422,219
Int. Cl.[3] H04R *19/02*; G08C *9/02*
U.S. Cl. 179—111 R 22 Claims



5. A transducer for converting a digital signal, received serially by code word, to pulsed sound at a pulse rate corresponding to the digital signal encoding rate, with the decoding of the digital signal occurring by striking a listener's ear with the pulsed sound comprising:

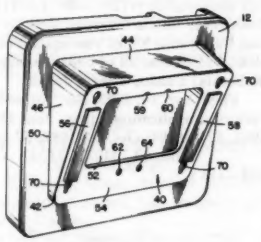
a plurality of substantially identical sound pressure generating elements each having a driver individually associated therewith, and

means operative in response to each code word to selectively energize said drivers in a pulsed manner at the signal encoding frequency in a combination of drivers determined for each code word by the states of the individual bits thereof.

4,515,998
CONVERTIBLE DESK TO WALL MOUNTED TELEPHONE SET

Edourd Pinede, Norwalk, and William J. Seidel, Stratford, both of Conn., assignors to PKS/Communications, Inc., Milford, Conn.

Filed Mar. 26, 1984, Ser. No. 593,581
Int. Cl.[3] H04M *1/04*
U.S. Cl. 179—146 R 9 Claims



1. A convertible support for a telephone console comprising:

a base member including an upper edge, a lower edge and a pair of wedge-shaped side edges connecting said upper edge to said lower edge,

said upper edge being of greater width than said lower edge,

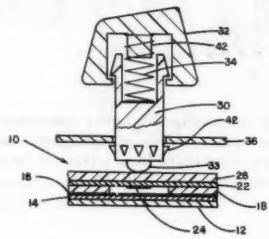
said base being hollow but including a top surface provided with:

means for securing said base to the rear surface of said console in a first position whereby said base can support said console on a substantially horizontal surface and an alternative second position defined by rotation of said base 180° relative to said console whereby said base can support said console on a substantially vertical surface, and means on said base for hanging said base and console upon a vertical surface.

4,515,999
FULL TRAVEL KEYBOARD

William P. Harper, Danielson, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Jan. 24, 1983, Ser. No. 460,370
Int. Cl.[3] H01H *13/70*
U.S. Cl. 200—5 A 17 Claims



1. A keyboard including:

membrane switching means, said membrane switching means having:

(a) lower circuit sheet means comprising a first sheet of insulating material with first electrically conductive means thereon;

(b) upper circuit sheet means comprising a second sheet of insulating material with second electrically conductive means on one surface thereof, facing said first circuit means; and

(c) spacer means between said first and second circuit sheet means, said spacer means having a plurality of openings therein for mechanical and electrical connection of selective parts of said first and second circuit means defining switch sites;

a layer of compressible elastomeric material on said upper circuit sheet means on the other surface thereof, said elastomeric material constituting a spring system having a predetermined compressibility value; and

a plurality of key means for actuating the switch sites, each of said key means including:

(a) switch actuator means in contact with said elastomeric layer at the location of a switch site;

(b) a stem;

(c) a key cap; and

(d) spring means normally spacing said cap from said stem, said spring means of said key means having a predetermined compressibility value.

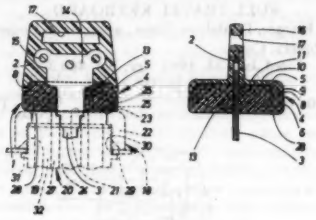
4,516,000
STARTER SWITCH ARRANGEMENT

Bertil Ryberg, Torslanda, and Kenth Mellgren, Kungsbacka, both of Sweden, assignors to Aktiebolaget Volvo Penta, Gothenburg, Sweden

Filed Sep. 9, 1983, Ser. No. 530,644
Claims priority, application Sweden, Sep. 16, 1982, 8205297
Int. Cl.[3] E05B *19/26*
U.S. Cl. 200—44 14 Claims

1. A starter switch arrangement for environments where a switch may be subject to intrusion of water, such as for a boat or the like during its utilization, said switch arrangement including: a switch, a key having a gripping component, an insert component to be inserted into an aperture in the switch for opening and locking the switch, and a cover component integrated with and positioned between said gripping component and said insert component, said cover component having a portion which is resilient in axial direction of the key and

presents a soft resilient surface generally parallel to and provided to abut against a front surface of the switch in the inserted position of the key, said resilient surface being arranged



for sealingly supporting the cover component against the switch in the inserted position of the key and sealingly close at least a major portion of the front surface of the switch around said aperture.

4,516,001

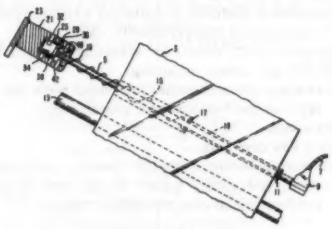
AUTOMOBILE HORN CIRCUIT AND REPLACEMENT PART THEREFOR

Frank M. West, 113 Weston Pl., Eatontown, N.J. 07724

Filed May 26, 1983, Ser. No. 498,308

Int. Cl.³ H01H *9/00;* **H01R** *39/00*

U.S. Cl. 200—61.54 **7 Claims**



5. A partial automobile horn circuit comprising a horn wire which runs up the steering column of the automobile and is attached to the lower end of a spring loaded metal rod which passes through a plastic portion of a control yoke which is mounted just below the steering wheel of said automobile, the upper end of said spring loaded rod forming an electrical brush head which rides on a slip ring on the underside of said steering wheel, a hollow metal cap designed with a bore therein to accommodate the diameter of said brush head, said hollow metal cap being adapted to be slipped over said electrical brush head which has become worn and inoperative, said hollow metal cap providing a replacement brush head.

6. The partial automobile horn circuit of claim **5** wherein said hollow metal cap comprises a plurality of pairs of slots which communicate with the hollow portion thereof, one or more of said pairs of slots having spring clips inserted therein for securing said metal cap over said worn brush head.

4,516,002

CIRCUIT BREAKER WITH ARC LIGHT ABSORBER

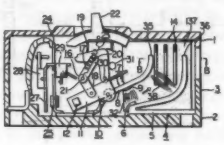
Shirou Murata; Hajimu Yoshiyasu, both of Itami; Fumiyuki Hisatsune, Fukuyama; Shinji Yamagata, Fukuyama, and Junichi Terachi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyodaku, Japan

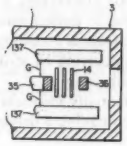
Filed Apr. 14, 1983, Ser. No. 485,581

Claims priority, application Japan, Apr. 15, 1982, 57-64396; Apr. 15, 1982, 57-64397; Apr. 15, 1982, 57-64399

Int. Cl.³ H01H *33/00*

U.S. Cl. 200—144 C **9 Claims**





1. A circuit breaker with an arc light absorber comprising:

a pair of contactors contained in an insulating container for opening or closing an electric circuit;

electric conductors extending to said electric contactors and contacts and arc runners extending from said conductors away from said contactors; and

arc light absorbing side walls provided on both sides of said arc runners for absorbing the arc light energy irradiated directly from the arc produced between said contactors when said contactors open;

said side walls being formed of a heat resistant, electrically insulating, light absorbing material having more than 35% apparent porosity.

4,516,003

CIRCUIT BREAKER WITH ARC LIGHT ABSORBER

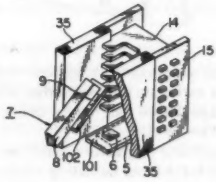
Hajimu Yoshiyasu; Shirou Murata, both of Itami; Fumiyuki Hisatsune, Fukuyama; Shinji Yamagata, Fukuyama, and Junichi Terachi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 485,582

Claims priority, application Japan, Jun. 15, 1982, 57-90604; Oct. 22, 1982, 57-186304; Oct. 29, 1982, 57-165390

Int. Cl.³ H01H *33/00*

U.S. Cl. 200—144 C **12 Claims**



1. A circuit breaker with an arc light absorber comprising:

a pair of electric contactors contained in an insulating container for opening or closing an electric circuit;

electric conductors extending to said electric contactors and contacts on said conductors; and

a pair of side walls provided on both sides of said contactors in spaced opposed relation to each other and having a size for absorbing light from the arc formed when said contactors open and close;

said side walls being formed of a heat resistant, electrically insulating, light absorbing material having more than 35% apparent porosity.

4,516,004

VACUUM SWITCHING TUBE WITH A HELICAL CURRENT PATH

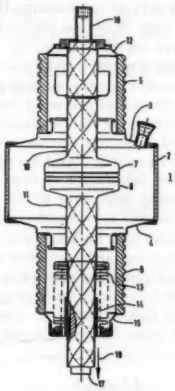
Peter-Michael Bany; Wolfgang Berger; Hans Bettge; Gunter Bialkowski; Rafl Rozek; Norbert Steinemer, and Claus-Jurgen Volkmann, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,198

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232708

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **18 Claims**



1. In a vacuum switching tube including an evacuated housing, contacts movable relative to each other disposed within the housing and a current lead connected to at least one of the contacts, the improvement comprising the current lead comprising a core having a helical outer contour and a conductor surrounding the core, the core having a conductivity which is less than that of the conductor.

4,516,005

SEQUENCED INTERMITTENT BLOWOUT COIL CONTROLLER

Paul M. Gallatin, Picayune, Miss.; Henry J. Dyken, and Norbert F. Cvengros, both of Slidell, La., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 30, 1983, Ser. No. 537,708

Int. Cl.³ H01H *9/44*

U.S. Cl. 200—147 R **11 Claims**

1. In a circuit switch of the contactor type adapted to open and close a circuit carrying sufficient current to cause arcing to occur when the circuit is opened and having an arc chute for extinguishing the arc and magnetic pole plates for urging the arc into the arc chute,

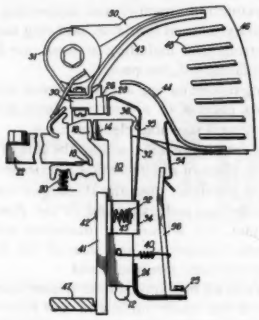
a pair of main contact set comprising a fixed and a movable contact for carrying load current;

a pair of auxiliary contacts;

connecting means for coupling said auxiliary contacts in parallel with said main contacts to form a shunt circuit about said main contacts;

means for opening and closing said main contacts;

means for causing said first pair of auxiliary contacts to open after, and to close before, said main contacts open and close, respectively, and



means for opening said shunt circuit subsequent to the closing of said main contacts.

4,516,006

PUFFER TYPE GAS-BLAST CIRCUIT BREAKER

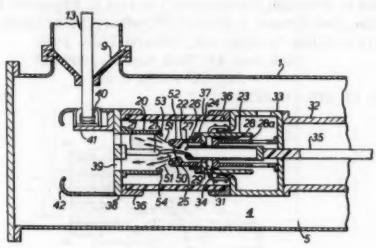
Akio Kobayashi; Hitoshi Mizoguchi, both of Yokohama; Hisatoshi Ikeda, Zushi, and Hidekiyo Mayama, Yokohama, allof, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 2, 1983, Ser. No. 463,121

Claims priority, application Japan, Mar. 9, 1982, 57-35868

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **2 Claims**



1. A puffer type circuit breaker mounted in a tank containing an insulating gas, comprising:

a movable electrode and a fixed electrode disposed opposite each other, said electrodes being separable for implementing a circuit-breaking action;

a fixed current-carrying contact having an inside surface arranged around a periphery of said fixed electrode and having an extreme end portion defining an innermost portion on a side of said fixed current-carrying contact nearest said movable electrode;

said movable electrode having an end facing said fixed electrode and comprising an insulating nozzle surrounding said end;

a puffer chamber comprising a puffer piston and a puffer cylinder with which said movable electrode is connected for housing insulating gas;

wherein an arc extinction chamber is formed by said electrodes and insulating nozzle in the space between the electrodes;

wherein movement of the movable electrode during separation thereof from the fixed electrode compresses the insulating gas in the puffer chamber such that said gas is released towards said extinction chamber and blows out an

arc formed between the movable and fixed electrodes in the arc extinction chamber;

a cylindrical insulator having an inside surface surrounding said arc extinction chamber and supporting a ring at an end of said cylindrical insulator, said ring supporting said fixed electrode and including at least one hole through which insulating gas can pass;

said insulating nozzle having a tapered inside surface tapered to a throat portion in a direction from said stationary electrode to said movable electrode;

wherein in a circuit-breaking action, the line of extension of the inside surface of the insulating nozzle downstream, as regards the gas flow, from the throat portion of the said insulating nozzle, and extending in the direction of the fixed contact, lies within the innermost portion of the extreme end portion, on the side of the fixed contact nearest the movable electrode; and

wherein in a circuit breaking action, heated insulating gas is blow only in the inside surface of said fixed contact and through said hole in said ring to mix with and be cooled by insulating gas in said tank such that heated insulating gas is prevented thereby from being blown on the inside surface of the insulator.

4,516,007

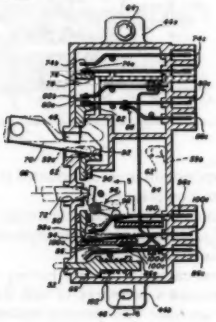
INTERLOCK SWITCH MODULE FOR A MICROWAVE OVEN

Mark G. Ringdahl, Chanhassen; Lambert L. Raymond, Robbinsdale, and Richard J. Scherer, Woodbury, all of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 19, 1982, Ser. No. 409,685

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 D **19 Claims**



1. An interlock switch module for use in a microwave oven comprising:

(a) a unitary housing having a generally flat surface containing actuator apertures therein and having mounting means formed as a part thereof; and

(b) a plurality of interlock switches positively located in said housing such that such switches are fixed relative to said apertures and further that said switches are positionable only along an axis substantially perpendicular to said flat surface and only as a group with respect to actuators when said actuators are received in said apertures by positioning and securing said mounting means on an adjacent mounting surface.

4,516,008

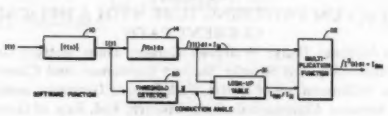
SYSTEM FOR CALCULATING THE ROOT MEAN SQUARE (RMS) CURRENT IN A RESISTANCE WELDING SYSTEM

Gary A. Jones, Chatsworth, Calif., assignor to Pertron Controls Corporation, Canoga Park, Calif.

Filed Mar. 14, 1983, Ser. No. 475,172

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—109 **5 Claims**



1. A system for caluculating the RMS value of a sinusoidal current flowing in an inductive/resistance welding system, or the like, comprising: an input circuit for receiving a sinusoidal current I(t); a full-wave rectifier circuit connected to said input circuit for providing a current representing the absolute value of the sinusoidal current $|I(t)|$; an integrating circuit connected to said full-wave rectifier circuit for deriving a signal I_N representative of the integral $\int I(t)dt$ of the output of the full-wave rectifier circuit; circuitry including a threshold detector circuit connected to said full-wave rectifier circuit for producing a signal representing the conduction angle γ of the sinusoidal current; and a microprocessor means including a look-up table stored in its memory, said microprocessor means being connected to the integrating circuit and to said last-named circuitry and being responsive to the outputs I_N and γ of the integrating circuit and last-named circuitry for producing a signal derived from said look-up table representing the ratio of two signals I_{RN}/I_N, and said microprocessor means including means for performing a multiplication function for multiplying the output I_N of said integrating circuit and the output I_{RN}/I_N of said look-up table to obtain a signal I_{RN} representing the RMS value of the sinusoidal current.

4,516,009

CAPACITOR-TYPE HF POWER SUPPLY FOR ELECTRICAL MACHINING

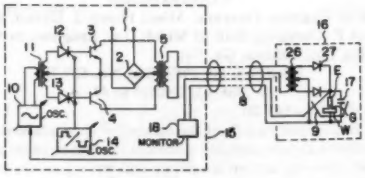
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 4, 1979, Ser. No. 45,177

Claims priority, application Japan, Jun. 14, 1978, 53-72446; Jun. 16, 1978, 53-53446; Jun. 21, 1978, 53-75117; Sep. 20, 1978, 53-115449

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 P **18 Claims**



1. A capacitor-type power supply for electrical machining, comprising:

a gap circuit disposed in the vicinity of a machining gap and including a capacitor connected across said machining gap via conductors of a minimum length;

a high-frequency power generator disposed remote from said machining gap for providing a high-frequency electric power at an output thereof; and

a feeder for connecting said output of said power generator with said gap circuit to permit said capacitor to be charged pulsively with said high-frequency electric power and to be discharged through said machining gap via said conductors of a minimum length to produce machining pulses at said machining gap, said conductors having a stray inductance not greater than 1 microhenry, said minimum length and said vicinity of said machining gap and said stray inductance being such that the conductors leading to said gap are free from significant loss of power and that the wave form of each of said machining pulses is substantially free from distortion, said gap circuit including a rectifier disposed in said vicinity to said machining gap and connected with said capacitor for rectifying the charging current therefor.

4,516,010

METHOD OF MANUFACTURING A RADIATION RECEIVER

Hans P. Huber, and Jochen Weber, both of Neu-Ulm, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,601

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143652

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LJ **9 Claims**

1. A method of manufacturing a radiation receiver having a cup-shaped part with an outer surface and a plurality of sensor elements with respective electrical leads on the outer surface, comprising:

applying a metallic layer to at least a portion of the outer surface of the cup-shaped part;

generating a laser beam;

focusing the laser beam onto the outer surface of the cup-shaped part; and

deflecting the laser beam along the cup-shaped part to establish a pattern of conductor tracks from the metallic layer which form the electrical leads.

4,516,011

PORTABLE ELECTRIC APPLIANCE FOR STEAMING HAIR ROLLERS PRIOR TO USE

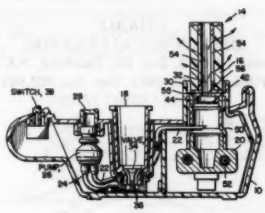
Ronald E. Jeffress, Monroe; David J. Wanat, Meriden, and Charles Z. Krasznai, Trumbull, all of Conn., assignors to Black & Decker, Inc., Newark, Del.

Filed Jul. 8, 1983, Ser. No. 511,834

Int. Cl.³ A45D *4/12;* **H05B** *3/02;* **F22B** *1/28*

U.S. Cl. 219—222 **7 Claims**

7. A vapor hairsetter including a housing; a water reservoir removably supported in said housing; boiler means supported in said housing; pump means supported in said housing and connected to transfer a measured charge of water from said reservoir to said boiler means; a hair roller supporting member in said housing, said supporting member having a steam outlet orifice therethrough connected to said boiler means to receive generated steam therefrom through a predetermined path to saturate a hair roller removably positioned on said supporting member; and valve means in said predetermined steam path



between said boiler means and said steam outlet orifice in said supporting member, said valve means permitting steam only to flow from said boiler means to said support member and roller.

4,516,012

DUAL FLOW HEATING APPARATUS

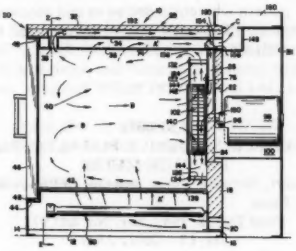
Robert C. Smith, Vergennes, and A. Benns Cox, II, North Ferrisburg, both of Vt., assignors to G. S. Blodgett Co., Inc., Burlington, Vt.

Division of Ser. No. 276,182, Jun. 22, 1981, Pat. No. 4,395,233. This application Jun. 22, 1983, Ser. No. 512,432

The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.

Int. Cl.³ A21B *1/26;* **F24C** *15/32;* **F27D** *11/02*

U.S. Cl. 219—400 **39 Claims**



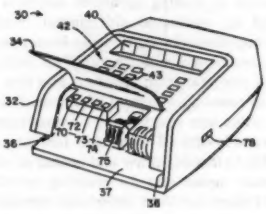
1. In a forced air heating apparatus having a heating compartment and an associated air conduit means connected thereto; the improvement comprising heater means disposed within said conduit means for heating an intake ambient air stream drawn into said conduit means at a first location, said conduit means enabling transport of a heated air stream from said heater means into said heating compartment at a second location physically spaced from said first location, air flow means operable to forcibly draw said heated air stream through said air conduit means and for enabling establishment of a recirculated forced air flow internally within said heating compartment without entry of said internal forced air flow into said air conduit, a divider baffle positioned parallel to and spaced from a wall of said heating compartment, said divider panel having an opening centrally located therein for enabling the through flow of the recirculated forced air flow, said air flow means comprising an air fan positioned between said panel and said wall of said heating compartment and having its plane of rotation disposed parallel to said divider panel, and said air fan having means for drawing two air streams there into along opposite axial directions and for centrifugally ejecting and mixing the two air streams within said heating compartment in the space between said divider baffle and said

heating compartment to enable the outflow of heated air from said heating compartment.

4,516,013
DECOYING CALCULATOR
Robert W. Hester, Rte. 1, Box 1B, Fairfield, N.C. 27826
Filed Jun. 20, 1983, Ser. No. 505,901
Int. Cl.³ G06C *27/00*
U.S. Cl. 235—78 R **8 Claims**

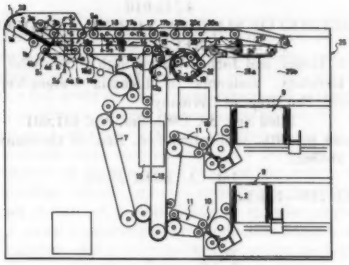
1. A means for illustrating a preferred decoy set comprising: a base; indicia in the central portion of said base for alignment with a physical location; a generally transparent disc rotatively mounted on said base with the center thereof disposed centrally of said base indicia; a point on said disc outwardly of its center to be disposed in the direction of ambient wind; and at least one indicia on said disc illustrating a preferred decoy deployment pattern whereby, relative to said physical location, proper placement of decoys can be determined relative to ambient wind direction.

4,516,014
DATE CHECKING DEVICE FOR ELECTRONIC POSTAGE METER
Alton B. Eckert, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Dec. 8, 1982, Ser. No. 447,911
Int. Cl.³ G07G *1/00*
U.S. Cl. 235—101 **6 Claims**



6. In a mailing machine housing, a power switch attached to said housing, means for supplying power connected to said power switch, a light on said housing and connected to said power switch, a microprocessor connected to said power switch, said microprocessor being operative to disable the mailing machine and turning on said light when said power switch is turned on, and a key mounted on said housing and connected to said microprocessor whereby said microprocessor turns off said light when said key is actuated and initializes the mailing machine.

4,516,015
AUTOMATIC MONEY RECEIVING AND DISBURSING MACHINE
Isamu Uchida, deceased, late of Chigasaki, Japan (by Kazuko Uchida and Chigusa Fujii, heiresses); Eiichi Kokubo, Tokyo, Japan; Kyoichi Osako, Tokyo, Japan; Makoto Yamazaki, Tokyo, Japan; Shinichi Imura, Tokyo, Japan; Junichi Arikawa, Tokyo, Japan; Kowichi Goi, Tokyo, Japan; Hiroshi Hongou, Tokyo, Japan; Takashi Shinozaki, Tokyo, Japan, and Hiroshi Emori, Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan
Filed Jun. 16, 1982, Ser. No. 388,984
Claims priority, application Japan, Jun. 16, 1981, 56-92541
Int. Cl.³ G07D *11/06*
U.S. Cl. 235—379 **7 Claims**



1. An automatic note receiving and disbursing machine having a receiving mode where notes are received therein and a disbursing mode where notes are disbursed therefrom, said machine comprising:

a transacting section for receiving and disbursing notes;

a first transfer passage for transferring notes;

a discriminating means located in the first transfer passage for making a first discrimination and determining whether notes passing through the first transfer passage are normal;

a second transfer passage positioned downstream from the transacting section and upstream from the first transfer passage for transferring notes from the transacting section to the first transfer passage;

a disbursing means for storing notes to be disbursed;

at least one third transfer passage located downstream from the disbursing means and upstream from the first transfer passage for transferring notes from the disbursing means to the first transfer passage;

a storage means located downstream from the first transfer passage for receiving and temporarily storing notes from the first transfer passage;

a note holding means located downstream from the storage means for receiving notes from the storage means;

a fourth transfer passage located downstream from the first transfer passage and adjacent to the storage means, said fourth transfer passage being in communication with the transacting section for transferring notes selectively from one of the first transfer passage and the storage means to the transacting section;

a circulation path defined by the fourth transfer passage, the second transfer passage, the first transfer passage and the storage means;

first means for transferring notes received from the transacting section through the second transfer passage, the first transfer passage, and the storage means to the note holding means and then storing said notes in the note holding means during the receiving mode;

second means for transferring notes from the disbursing means through the third passage, the first transfer passage and the fourth transfer passage and then discharging said notes from the transacting section during the disbursing mode; and

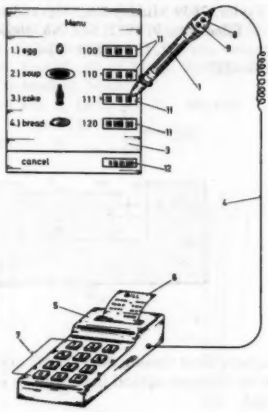
means for making a second discrimination of notes by passing notes through said discriminating means again in the circulation path when notes are judged to include abnormal notes during the disbursing mode.

4,516,016

APPARATUS FOR RECORDING AND PROCESSING GUEST ORDERS IN RESTAURANTS OR THE LIKE

Rudolf S. Kodron, D-6500 Mainz 1, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,004
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—472 **2 Claims**



1. Apparatus for ascertaining and computing orders in gastronomic and similar establishments with input devices for data pertaining to the orders at the tables and with a central accepting location for the data pertaining to orders, characterized

by the provision at each table of a menu with a plurality of bar code patterns which are associated with the foods or beverages to be ordered,

in that a reading pencil is available at each table for optical scanning of the bar code patterns, each such pencil being provided with an activating key and an indicating device which, after scanning of a code pattern with the reading pencil, lights up in green color if the order can be fulfilled by the establishment and which intermittently lights up in red color if the order cannot be fulfilled by the establishment, and

in that a printer for checks is provided at the central accepting location.

4,516,017

HIGH-SENSITIVE OPTICAL READING APPARATUS AND METHOD OF READING OPTICAL INFORMATION

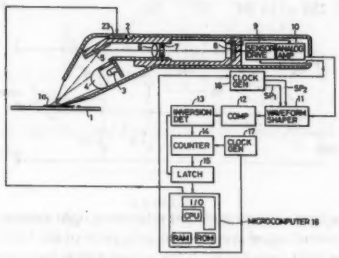
Masahiro Hara, Kariya; Atsutoshi Okamoto, Aichi, and Toshiyasu Sakai, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 14, 1983, Ser. No. 458,022
Claims priority, application Japan, Jan. 20, 1982, 57-8142; Sep. 28, 1982, 57-169189
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—472 **13 Claims**

1. An optical reading apparatus for converting optically readable information into an electrical signal, comprising:

a charge transfer device image sensor for converting optical information into an electrical signal, said image sensor having a plurality of optical imaging elements arranged in an array, said optical imaging elements being electrically divided into two or more groups so that signal charges from one group can be derived simultaneously, said image sensor having an output circuit responsive to a plurality of electrical signals each produced by each of said two or more groups so that said plurality of electrical signals are combined as a single output signal;

means for driving said image sensor so that said image sensor performs electronic scanning by deriving signal charges from said optical imaging elements, said means producing



at least two clocks which are shifted by an amount of time from each other, said at least two clocks being fed to said image sensor in such a manner that at least two groups of said optical imaging elements are driven alternately; and

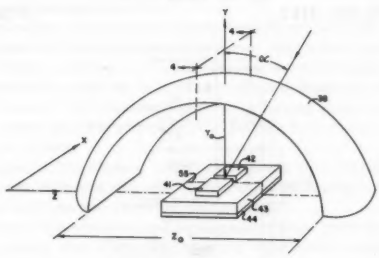
means responsive to said output signal from said image sensor for processing the same to produce an electrical signal indicative of the read information.

4,516,018

SOLAR SENSING ARRANGEMENT FOR USE IN A UNIAXIS SOLAR COLLECTOR TRACKING SYSTEM

Joseph S. Bodenheimer, and Naphtali Eisenberg, both of Jerusalem, Israel, assignors to Luz International Ltd., Los Angeles, Calif.

Filed Dec. 7, 1981, Ser. No. 328,183
Claims priority, application Israel, Sep. 4, 1981, 63740
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—203 R **10 Claims**



1. A solar collector system comprising:

a shaped concentrator means,

energy absorption means focally positioned with respect to said concentrator,

means for realigning said system to track the sun,

sensor means determining when the system must be realigned,

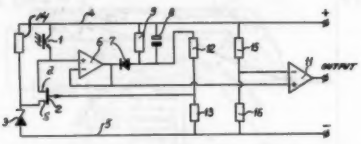
said sensor means comprising radiation detector means for providing a signal responsive to impinging radiation, and

said sensor means also comprising focusing means for focusing the radiation into an astigmatic image positioned on said detector means to generate said alignment signals.

4,516,019
LIGHT DETECTOR CIRCUIT

Bastiaan B. B. Eertink, Grubbenvorst, and Hendrikus J. van Esch, Veldhoven, both of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Jul. 16, 1982, Ser. No. 398,795
Claims priority, application Netherlands, Jul. 21, 1981, 8103439
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 RC **11 Claims**

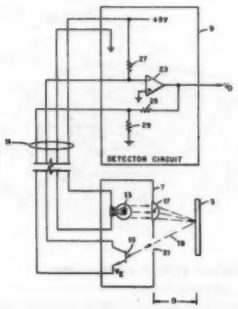


1. In a light detection circuit wherein a light detector is used and an output signal is produced indicative of the light incident upon the light detector with the output signal having a desired stabilizing level representative of light incident upon the light detector, said output signal being applied through a signal leveling circuit to a voltage stabilizing control circuit connected to stabilize the voltage of the output signal, the improvement which comprises a voltage stabilizing circuit including a voltage variable resistance element which is connected in series with the light detector across a voltage source and comparator means having a first input coupled to said output signal and having a second input coupled to the output of said signal leveling circuit, said comparator means producing an output when a light change of short duration is incident upon the light detector.

4,516,020
LIGHT-OPERATED PROXIMITY DETECTOR WITH LINEAR OUTPUT

Marc L. Simpson, Harriman, and David R. McNeilly, Maryville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1982, Ser. No. 453,982
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 L **6 Claims**

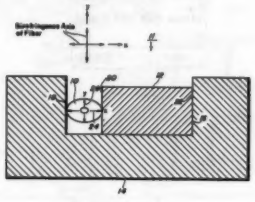


1. A light-operated proximity detector, comprising:
a light source;
focusing means for focusing a beam of light from said light source onto a surface whose proximity to said detector is to be gauged;
a phototransistor having emitter and collector electrodes and disposed to receive a reflected portion of said beam from said surface at a light-sensitive surface thereof;
biasing means for biasing said transistor to operate in a saturated state;
an operational amplifier having an inverting input connected to the collector of said phototransistor, a non-inverting input connected to ground potential and an output;
a resistance feedback network coupled between the output of said amplifier and said emitter electrode of said phototransistor so that a signal at the output of said amplifier is produced which is linearly proportional to the proximity of said surface to said detector.

4,516,021
FIBER OPTIC MAGNETIC FIELD SENSOR

Henry F. Taylor, 7839 Midday La., Alexandria, Va. 22306

Filed Aug. 9, 1982, Ser. No. 406,427
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **23 Claims**

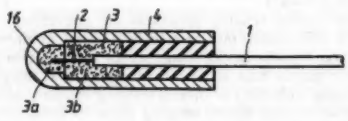


1. A magnetic field sensing field system comprising:
a length of birefringent optical fiber with an input end and an output end;
a light source for introducing light signals with polarization components in each of the birefringent axes into said input end of said optical fiber so that both light polarizations propagate therein;
a device for modulating the birefringence in a portion of said optical fiber in accordance with a magnetic field to be sensed;
a conversion element for converting the birefringence modulation to light intensity modulation; and
means for detecting the light output signal from said conversion element;
wherein said birefringent modulating device includes
a support structure;
a section of magnetostrictive material, which is large compared to the size of said portion of optical fiber, disposed relative to said portion of optical fiber and said support structure to cause a compression force to be exerted in the radial direction on the optical fiber in the presence of a magnetic field thereby changing its birefringence.

4,516,022
DETECTION OF LIGHT-PRODUCING EVENTS

Carl E. Lindgren, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 1, 1982, Ser. No. 413,828
Claims priority, application Sweden, Sep. 4, 1981, 8105259
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **10 Claims**



1. In a device for detecting an undesired, light-producing

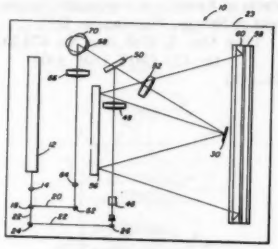
event in a protected installation, said device including a detector, a fiber optic means and a monitory unit, said detector being capable of directing at least part of the light produced by the undesired event into the field of view of a first end of the fiber optic means, the second end of the fiber optic means being connected to said monitoring unit, the improvement wherein said detector comprises at least one body surrounding said first end of said fiber optic means, each said body being composed of a material which defines therein a plurality of light-refracting surfaces which refract at least some of the light striking said material from the undesired event into the field of view of the first end of said fiber optic means.

4,516,023

SCANNER/PLOTTER OPTICAL SYSTEM

David R. Morrill, Salisbury; Mark T. Mason, Somerville, and Paul M. Green, Lowell, all of Mass., assignors to Klimsch/Optronics, Chelmsford, Mass.

Filed Jun. 3, 1982, Ser. No. 384,610
Int. Cl.³ H01J 5/16
U.S. Cl. 250—235 **9 Claims**



1. A laser beam scanner comprising:
(1) laser light beam generating means;
(2) means for splitting the laser light beam into an encoder beam and a scan beam
(3) means including an oscillating mirror for: scanning the scan beam back and forth across a scan plane: and, scanning the encoder beam back and forth across an encoder grating comprising alternating laser light reflecting and absorbing elements;
(4) means for forming an image of the face of said oscillating mirror; and,
(5) photodetector means located at and being responsive to the image of said oscillating mirror face.

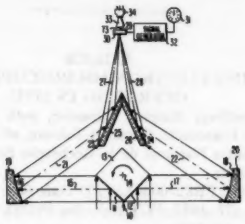
4,516,024

AUTOMATICALLY ADJUSTABLE APERTURE STOP FOR OPTICAL SCANNING SYSTEM

Kenneth C. Hudson, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 23, 1982, Ser. No. 410,483
Int. Cl.³ H01J 3/14; G01C 3/08
U.S. Cl. 250—236 **23 Claims**

1. In an optical scanning system having a surface onto which converging light signals are focused, an apparatus for limiting the area of said surface exposed to said light signals, said apparatus comprising:
a first movable baffle positioned to occult a first area of said surface;
a second movable baffle positioned to occult a second area of said surface, said first and said second baffles being coupled to move in tandem;
means for generating a control signal indicative of one boundary of a range of positions from which said converging light signals are directed toward said surface; and



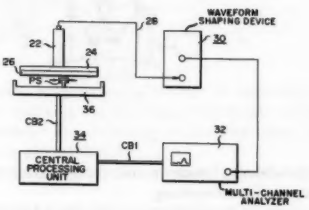
means for moving said first baffle in response to said control signal.

4,516,025

METHOD AND APPARATUS FOR CONTROLLING SCINTILLATION CAMERA

Tsutomu Yamakawa, Otawara; Mineki Nishikawa, Tochigi, and Tomohiko Kihara, Otawara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1981, Ser. No. 304,874
Claims priority, application Japan, Sep. 26, 1980, 55-134084
Int. Cl.³ G01T 1/20
U.S. Cl. 250—252.1 **5 Claims**



1. A scintillation camera control apparatus comprising:
means for forming visible light from radiation emitted from radioisotopes in a body;
means for converting the visible light from the radiation to electrical impulses including a two dimensional array of photomultiplier tubes which receive the visible light from common radiation and give electrical impulses as a result thereof, said photomultiplier tubes having their own response curve as a function of a distance from the center of sensitivity;
means for determining said own response curve relative to predetermined apparent radiations so as to obtain a measured response curve for calibrating;
means for calibrating said measured response curve by correcting the electrical impulses from said converting means, said calibrating means including a threshold circuit for removing from the electrical impulses those signals having a level lower than a predetermined threshold level, said predetermined threshold level being controlled in response to energy levels of the electric impulses;
a nonlinear circuit having a parameter for nonlinearity correction, said parameter being controlled in response to the measured response curve; and
a separating circuit connected between the threshold circuit and the nonlinear circuit, said separating circuit electrically separating the threshold circuit from the nonlinear circuit in such a manner that the control of both said predetermined threshold level of the threshold circuit and

said parameter of the nonlinear circuit can be independently performed.

4,516,026

SCANNING ELECTRON MICROSCOPE ASSEMBLY OPERATING IN SITU

Bernard Jouffrey; Jacques Trinquier, both of Toulouse, and Jean-Luc Franceschi, Castanet-Tolosan, all of France, assignors to Centre National de la Recherche Scientifique CNRS, Paris, France

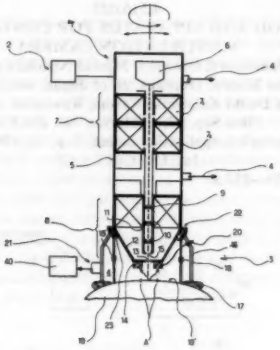
PCT No. PCT/FR82/00021, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/02796, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 2, 1982, Ser. No. 432,918

Claims priority, application France, Feb. 4, 1981, 81 02152

Int. Cl.³ H01J *37/18, 37/20, 37/26*

U.S. Cl. 250—310 **7 Claims**



1. A scanning electron microscope assembly adapted to operate in situ comprising:

a column unitary microscope having a base and connection means adapted for connecting said microscope to a control and checking system and to a pumping system;

supporting means, connected to a lower part of the column, for supporting said column and for defining an internal chamber having a lower open portion adapted to be disposed in tight abutment with a surface integral to a portion of said surface to be observed;

sleeve means for communicating said internal chamber to said pumping system; and

adjusting means for adjusting the distance between a lower end of said column and said surface to be observed.

4,516,027

INFRARED DETECTOR

Wolfgang Schimmelpfennig, Schönau, and Heinz-Jürgen Siede, Bad Neustadt, both of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

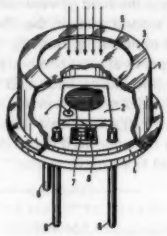
Filed Jan. 24, 1983, Ser. No. 460,568

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202819

Int. Cl.³ G01J *5/10*

U.S. Cl. 250—338 **8 Claims**

1. An infrared detector for absorbing and detecting infrared radiation comprising a system of multiple layers applied to a substrate wherein the uppermost layer is an infrared absorbing layer and comprises a chemically resistant and electrically conductive compound of a preselected metal and its oxide, said absorbing layer having a degree of surface roughness approxi-



mately equal to or greater than the wavelengths of the infrared radiation to be absorbed.

4,516,028

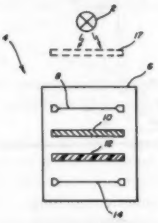
PULSE FLUX MEASURING DEVICE

William C. Riggan, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 8, 1983, Ser. No. 473,283

Int. Cl.³ G01T *3/08, 3/02*

U.S. Cl. 250—370 **17 Claims**



1. A device for measuring particle flux comprising:

first and second sequentially arranged photodiode detector means for receiving flux from a source;

shield means, interposed between said first and second photodiode detector means, for shielding said second detector means from a portion of the flux received by said first detector means;

first and second output means for producing first and second output signals representative of the flux incident to said first and second photodiode detector means, respectively; and

compensation means for reducing said first output signal by a magnitude equivalent to a portion of said second output signal.

4,516,029

E BEAM STAGE WITH BELOW-STAGE X-Y DRIVE

Theodore W. Tucker, Lincoln, Mass., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 28, 1983, Ser. No. 489,666

Int. Cl.³ H10J *37/20*

U.S. Cl. 250—442.1 **6 Claims**

1. An electron beam X-Y coordinate positioning stage with below stage drive, comprising:

a base plate fixedly mounted and having a first central aperture and a pair of lateral guides;

an X plate slidably mounted on said base plate between said guides and constrained thereby to move in an X direction; said X plate having a first lateral aperture aligned in the X

direction and a second central aperture aligned in the Y direction; said first lateral and said second central apertures intersecting at right angles;

said first lateral aperture having a pair of X wing slots mounted in said X plate at opposite ends of the aperture; said X plate having a second pair of lateral guides;

a Y plate slidably mounted on said X plate between said second guides and constrained thereby to move in an Y direction; said Y plate having a second lateral aperture aligned in the Y direction and having a pair of Y wing slots mounted in said Y plate at opposite ends of the aperture;

a theta plate mounted on said Y plate;

an X bearing mounted in said base plate;

a Y bearing mounted in said X plate;

a theta bearing mounted in said Y plate;

a theta drive shaft slidably mounted in said theta bearing and fixedly coupled to said theta plate from below;

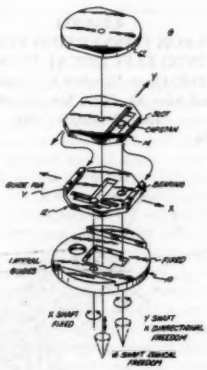
a Y drive shaft rotably mounted in said Y bearing;

a Y capstan fixedly mounted on said Y drive shaft in said second lateral aperture;

an X drive shaft rotably mounted in said X bearing;

an X capstan fixedly mounted on said X drive shaft in said first lateral aperture;

a Y band means looped mounted on said Y capstan and attached at its opposed ends to the Y plate in said Y wing



slots; an X band means looped mounted on said X capstan and attached at its opposite ends to the X plate in said X wing slots;

a theta universal joint coupled to said theta drive shaft;

a lower theta drive shaft coupled to said theta universal joint;

a Y universal joint coupled to said Y drive shaft;

a lower Y drive shaft coupled to said Y universal joint;

a bellows coupling mounted on said lower Y drive shaft;

an electron beam chamber bottom plate;

an X seal bearing means mounted in said bottom plate;

a Y seal bearing means mounted in said bottom plate;

a theta bearing means mounted in said bottom plate;

said X drive shaft rotably mounted in said X seal bearing means;

a Y connecting drive shaft rotably mounted in said Y seal bearing means and coupled to said bellows coupling;

said lower theta drive shaft rotably mounted in said theta seal bearing means;

means for driving said lower theta shaft in the vertical (Z) direction fixedly mounted below said bottom plate and coupled to said lower theta shaft;

means for rotating said X drive shaft fixedly mounted below said bottom plate and coupled to said X drive shaft; and

means for rotating said Y connecting drive shaft fixedly mounted below said bottom plate and coupled to said Y connecting plate.

4,516,030

SCANNING ELECTRON BEAM EXPOSURE SYSTEM

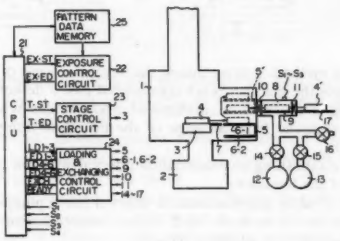
Haruo Tsuchikawa, Yokohama, and Junichi Kai, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1982, Ser. No. 423,644

Claims priority, application Japan, Sep. 26, 1981, 56-152661

Int. Cl.³ A61K *27/02;* **B65G** *65/30;* **H01J** *37/00*

U.S. Cl. 250—492.2 **3 Claims**



1. An electron beam exposure system, for exposing a workpiece and for receiving exposure interrupt signals, comprising:

a main chamber for projecting an electron beam onto the workpiece placed therein;

a first gate valve operatively connected to said main chamber;

a subchamber operatively connected to said first gate valve;

a second gate valve operatively connected to said subchamber;

vacuum pump means, operatively connected to said second gate valve, for decreasing the pressure in said subchamber;

a third gate valve operatively connected to said subchamber;

leaking means, operatively connected to said third gate valve, for increasing the pressure in said subchamber;

exposure control means, operatively connected to said subchamber, for controlling the projection of said electron beam onto the workpiece while the pressure in said subchamber is increasing or decreasing;

loading and exchanging control means, operatively connected to said subchamber, for controlling operations of said first, second, and third gate valves; and

central control means, operatively connected to said exposure control means and said loading and exchanging control means, for providing exposure start and exposure end signals to said exposure control means, while receiving the exposure interrupt request signals, before the opening and closing of at least one of said first, second, and third gate valves, for controlling said exposure control means, and for providing valve open and close permitting signals to said loading and exchanging control means to control said loading and exchanging control means, said central control means providing said exposure control means with a command to inhibit the projection of the electron beam onto the workpiece when noise generated by at least one of said first, second, and third gate valves substantially exists.

4,516,031

METHOD OF DETERMINING THE DEGREE OF WEAR OF BANK-NOTES AND A DEVICE FOR CARRYING OUT THIS METHOD

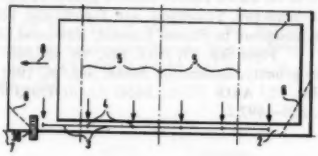
Wittich Kaule, Gauting; Walter Renz, Seefeld/Drössling, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,735

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139365

Int. Cl.³ G01H *21/88*

U.S. Cl. 250—562 **8 Claims**



1. A method of determining the degree of wear of banknotes wherein the banknotes are transported past a detection device having a plurality of juxtaposed photodiodes which detect light received from an edge of the banknote comprising the steps of:

(a) establishing an examination interval adjacent to one edge of the banknote;

(b) dividing the examination interval into a plurality of measurement sections, each measurement section being preceded by a selection section;

(c) selecting a single photodiode during passage of a selection section; and,

(d) using the output of the selected photodiode during passage of the subsequent measurement section to determine the wear of the banknote.

4,516,032

ELECTRO-OPTICAL IMAGING SYSTEM

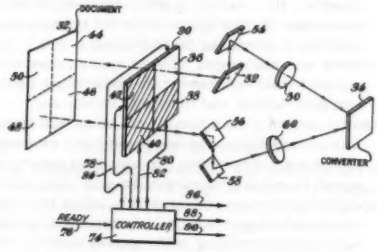
Colin Barr, Kildrum, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1981, Ser. No. 333,202

Claims priority, application United Kingdom, Dec. 22, 1980, 8041058

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—578 **26 Claims**



1. An optical imaging system for providing an electrical representation of an image, comprising:

image converter means for accumulating electrical charges representative of said image;

switch means, positioned between said image and said converter means, said switch means having a first state for allowing the incidence of said image onto said converter means and a second state for restricting the incidence of said image onto said converter means;

said converter means for accumulating said electrical charges frepresentative of said image only when said switch means is in said first state, said converter means further for moving said electrical charges to an output port of said converter means without accumulating further electrical charges when said switch means is in said second state; and

control means, coupled to said switch means, for providing a first command signal to switch said switching means to said first state for a first predetermined period of time and thereafter providing a second command signal to switch said switching means to said second state for a second period of time.

4,516,033

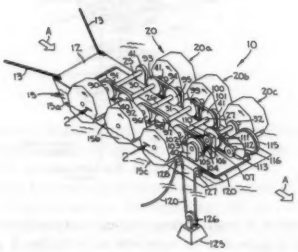
APPARATUS FOR CONVERTING FLOW OF WATER INTO ELECTRICAL POWER

Marvin Olson, 4457 Open Meadow Ct., San Jose, Calif. 95129

Filed May 31, 1983, Ser. No. 499,317

Int. Cl.³ F03B *7/00*

U.S. Cl. 290—54 **7 Claims**



1. Apparatus for converting the flow of water into electric power comprising:

(a) a floatable platform formed with opposite sides;

(b) a plurality of water wheels mounted on each side of said platform for rotation and adapted to be impelled by the flow of water for rotation;

(c) coupling means interconnecting said water wheels for transmitting hydrodynamic power, said coupling means comprising an axial shaft for each of said water wheels respectively, said axial shafts being rotatable in response to its associated water wheel being impelled to rotate by the flow of water, successive water wheels of said water wheels being located on said opposite sides of said platform, said coupling means interconnecting successive axial shafts of said axial shafts for transferring hydrodynamic power successively from axial shaft to axial shaft for progressively increasing the magnitude of transferred hydrodynamic power; and

(d) electric generating means responsive to the transmission of said hydrodynamic power for generating electric power.

4,516,034

CIRCUIT FOR OPERATING A DISPLACEABLE COMPONENT IN A MOTOR VEHICLE, IN PARTICULAR A MOTOR VEHICLE WINDOW

Axel Bier, Bad Rappenau, Fed. Rep. of Germany, assignor to Audi NSU Auto Union A.G., Fed. Rep. of Germany

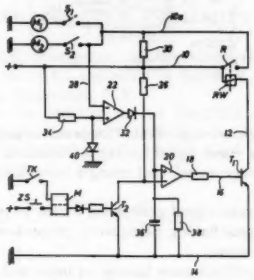
PCT No. PCT/DE83/00054, § 371 Date Nov. 7, 1983, § 102(e) Date Nov. 7, 1983, PCT Pub. No. WO83/03440, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 24, 1983, Ser. No. 555,877

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212324

Int. Cl.³ H02G *3/00*

U.S. Cl. 307—10 R **4 Claims**



1. A circuit for operating a displaceable component in a motor vehicle, by means of an electric motor which is connected to a voltage source by means of an operating switch in series with a contact of a relay with a coil the relay coil being actuated from the ignition switch and a door contact switch (TK) characterized in that a transistor (T1) is provided in the circuit of the relay coil (RW) whose base is connected with the output of a first comparator (20), the noninverting input of the first comparator (20) being connected with the output of a second comparator (22) and the inverting input of the first comparator is selectively grounded by closing the ignition switch (ZS) or by actuating the door contact switch (TK) or by an information storage (M) which is set by closing the ignition switch (ZS) and is cleared by actuating the door contact switch (TK), the inverting input of the second comparator (22) is connected to ground when the operating switch (S1 and/or S2) is closed and when the operating switch is open said inverting input of the second comparator being connected to the voltage source by means of a resistor (30); and a noninverting input of said second comparator (22) being connected with a reference voltage source, and an RC circuit (36, 38) is provided which influences the base of the transistor (T1) in a time delaying manner.

4,516,035

PHASE SYNCHRONIZATION AND CONTROL CIRCUIT

Paul M. Rhoads, Orlando, and Harold H. Cheffer, Longwood, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 22, 1983, Ser. No. 525,369

Int. Cl.³ H02J *9/00*

U.S. Cl. 307—66 **9 Claims**

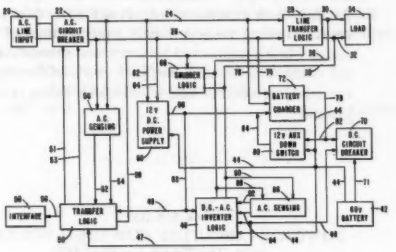
5. In an uninterruptible power supply which includes a main source of A. C. signals and an inverter for supplying A. C. signals from a D. C. source to a load upon failure of the main source to supply A. C. signals to the load, a circuit for generating control signals used to disable the main source from supplying A. C. signals to the load and for synchronizing the enabling of the main source to supply A. C. signals to the load comprising:

means for sensing the voltage level of the A. C. signals to the main source;

first means connected to said sensing means for comparing the voltage level of the A. C. signals to a zero voltage level for outputting a first control signal upon the occurrence of the coincidence;

oscillator means connected to said comparing means for outputting a plurality of first clock signals in response to receiving said first control signal;

a phase lock loop circuit connected to said oscillator means for outputting a plurality of second clock signals in response to receiving said first clock signals;



counting means connected to said phase lock loop circuit for outputting a count in response to receiving each of said second clock signals;

programmable memory means connected to said counting means for outputting a plurality of binary signals in response to receiving said count;

and means connected to said memory means for converting said binary signals to a referenced A. C. signal for use in detecting the failure of the main source to supply A. C. signals to the load.

4,516,036

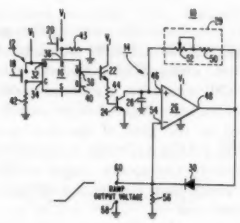
LINEAR RAMP VOLTAGE GENERATOR CIRCUIT

Richard D. Miller, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 23, 1982, Ser. No. 443,927

Int. Cl.³ H03K *4/08, 4/86*

U.S. Cl. 307—228 **2 Claims**



1. A generating circuit for producing a linear ramp output voltage comprising:

a logic chip having first and second input terminals, a reset terminal, and first and second output terminals;

a first transistor having a base, a collector, and an emitter, said base of said first transistor being connected to said first output terminal of said logic chip;

a second transistor having a base, a collector, and an emitter;

a first resistor connected between the emitter of said first transistor and the base of said second transistor;

a capacitor connected between said collector of said second transistor and ground;

an operational amplifier having first and second input terminals and an output terminal, said first input terminal being connected to said collector of said second transistor;

means for connecting said input terminals and said reset terminal of said logic chip, said collector of said first transistor, and said operational amplifier to a voltage source;

a feedback network connected between said first input terminal and said output terminal of said operational amplifier;

a feedback diode connected between said second input terminal and said output terminal of said operational amplifier; and

linear ramp output voltage means comprising a pair of output terminals connected across a load resistor, said load resistor having two terminals, one terminal of said load resistor being connected between said second input terminal of said operational amplifier and said feedback diode, the other terminal of said load resistor being connected to ground.

4,516,037

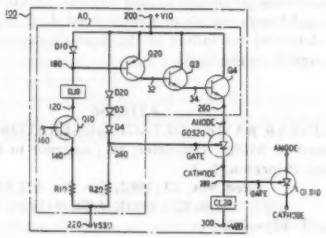
CONTROL CIRCUITRY FOR HIGH VOLTAGE SOLID-STATE SWITCHES

Peter W. Shackle, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 972,024, Dec. 20, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 158,054

Int. Cl.³ H03K *17/60*

U.S. Cl. 307—252 A **3 Claims**



1. Circuitry coupled to the gate of a first gated diode switch (GDS**1**, GDS**3**, GDS**4**, GDS**10**) which has a gate, an anode, and a cathode, comprising a second gated diode switch (GDS**2**, GDS**20**) which has a gate, an anode, and a cathode, the cathode of the second gated diode switch (GDS**2**, GDS**20**) being coupled to the gate of the first gated diode switch (GDS**1**, GDS**3**, GDS**4**, GDS**10**), a control circuit branch (A, A**0**) is coupled to the second gated diode switch (GDS**2**, GDS**20**) for controlling conduction between the anode and cathode thereof, and

being characterized in that:

the control circuit branch (A, A**0**) comprises:

a third switch branch (**Q1**, **Q10**) having a control terminal which is coupled to an input terminal (**16**, **160**), and having first (**12**, **120**) and second (**14**, **140**) output terminals;

a fourth switch branch (**Q2** and **Q20**, **Q3**, **Q4**) having a control terminal (**18**, **180**) coupled to the first output terminal (**12**, **120**) of the third switch branch and having first (**26**, **260**) and second (**20**, **200**) output terminals with the first output terminal (**26**, **260**) being coupled to the anode of the second gated diode switch (GDS**2**, GDS**20**); and

a level shifting branch (**D2**, and **D20**, **D3**, **D4**) having a first terminal coupled to the second output terminal (**20**, **200**) of the fourth switch circuit means (**Q2** and **Q20**, **Q3**, **Q4**), and having a second terminal (**24**, **240**) coupled to the gate of the second gated diode switch (GDS**2**, GDS**20**).

4,516,038

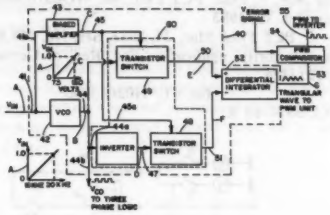
TRIANGLE WAVE GENERATOR

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 19, 1982, Ser. No. 442,928

Int. Cl.³ H03K *4/06, 4/48*

U.S. Cl. 307—264 **12 Claims**



1. A triangle wave generator for producing a constant amplitude triangle wave signal having a frequency proportional to an input voltage signal, said triangle wave generator comprising,

a square wave signal generating means to provide a square wave signal having a frequency proportional to said input voltage signal,

biased amplifier means having an input and an output, said input receiving said input voltage signal and said output coupled to a switching means,

said switching means coupled to said square wave signal generating means to receive said square wave signal and provide a pair of square wave signals to a positive and negative input terminal of a differential integrator, one of said pair of signals being the complemet of the other,

said differential integrator providing said constant amplitude triangle wave signal having constant amplitude and being proportional to said input voltage.

4,516,039

LOGIC CIRCUIT UTILIZING A CURRENT SWITCH CIRCUIT HAVING A NON-THRESHOLD TRANSFER CHARACTERISTIC

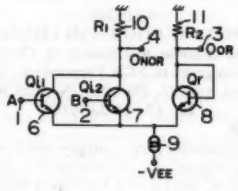
Isokazu Matsuzaki, Hiratsuka; Akira Yamagiwa, Kanagawa; Yutaka Watanabe; Takashi Matsumoto, both of Hadano, and Katsumi Yabe, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 840, Jan. 4, 1979, abandoned. This application Jan. 27, 1982, Ser. No. 343,379

Claims priority, application Japan, Jan. 9, 1978, 53-562

Int. Cl.³ H03K *19/086, 19/013*

U.S. Cl. 307—455 **17 Claims**



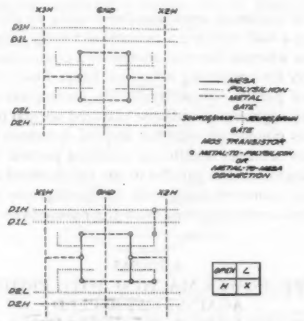
1. A non-threshold emitter-coupled logic current switch circuit comprising at least a pair of transistors, each of said transistors having a base, an emitter and a collector and being commonly connected to a constant current source on its emitter side, each of said transistors delivering an output signal at an output terminal on its collector side, an input signal being

applied to the base of one of said transistors, each collector of said transistors being directly supplied with a constant voltage level through a respective resistor, said resistors being directly connected without any intervening elements to said collectors, and the collector and the base of the other transistor being d.c. coupled directly to each other, wherein said respective resistors of the transistors have resistance values near to each other and a voltage level of the collector of said other transistor changes linearly in accordance with said input signal so that current switching is achieved between said transistors to alternately deliver output signals at the output terminals on the collector side of said transistors in accordance with the level of said input signal.

4,516,040
HIGH-SPEED MERGED PLANE LOGIC FUNCTION ARRAY

John M. Zapisek, Hauppauge, and Gus Giulekas, West Hempstead, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.

Division of Ser. No. 388,160, Jun. 14, 1982, Pat. No. 4,409,499. This application Jun. 9, 1983, Ser. No. 502,724
Int. Cl.³ H03K *19/177, 19/094;* **G06F** *7/48*
U.S. Cl. 307—468 **3 Claims**

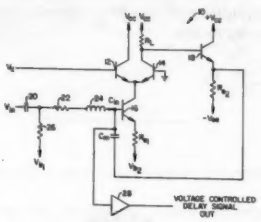


1. A method of programming a logic array including an "AND" plane and an "OR" plane, said method comprising the steps of (a) providing an array of parallel polysilicon input and output lines and a plurality of orthogonal metal ground and product-term lines, said input lines being grouped into closely spaced pairs, each of said input line pairs comprising input lines for carrying the true and complement of each input signal, said input line pairs being grouped to constitute an input row comprising input line pairs separated by a sufficient space to allow the formation of transistor pairs between the input line pairs, said output lines being grouped to constitute an output row comprising output lines separated by a sufficient space to allow the formation of transistor pairs between the output lines, said metal lines constituting a product-term column comprising two product-term lines and a central ground line separated by a sufficient space to allow transistor pair formation between at least one of said product-term lines and central ground line, (b) programming said "AND" plane by forming input transistor pairs within the intersections of said input rows and said product-term columns, said input transistor pairs comprising MOS transistors having grounded source terminals, separate gate terminals, and a common drain terminal, said grounded source terminals being connected to the central metal ground line of the containing product-term column, said gate terminal of each of said MOS transistors being connected to ground or to the true or complement input line of one of said input line pairs of the containing input row, said common drain terminal being connected to one of said product-term lines of the containing product-term column, and (c) programming said "OR" plane by forming output transistor pairs within the intersections of said product-term columns and said output rows, said output transistor pairs comprising MOS transistors having grounded source terminals, separate gate terminals, and a common drain terminal, said grounded source terminals being connected to the central metal ground line of the containing product-term column, said gate terminal of each of said MOS transistors being connected to ground or to one of the product-term lines of the containing product-term column, said common drain terminal being connected to one of the output lines of the containing output row.

4,516,041
VOLTAGE CONTROLLED VARIABLE CAPACITOR

Ronald Quan, Cupertino, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,250
Int. Cl.³ H03K *5/00;* **G06G** *7/18*
U.S. Cl. 307—494 **6 Claims**

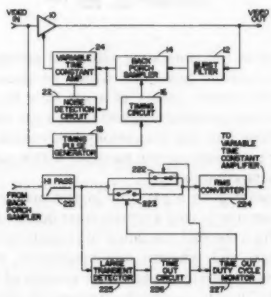


1. A voltage controlled capacitor circuit comprising an amplifier whose gain is voltage controllable and which has a circuit ground, an inverting signal, first input terminal, a first output terminal and a non-inverting control voltage input terminal and a capacitor connected between the first output terminal and the inverting, first input terminal of the voltage controlled amplifier, whereby the capacitance measured between the inverting, first input terminal of the amplifier and the circuit ground is variable as a function of control voltage applied to the control voltage input terminal.

4,516,042
CLAMP CIRCUITS

Michael D. Nakamura, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 30, 1982, Ser. No. 393,966
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—546 **7 Claims**



1. A circuit for providing a signal which is clamped to a desired DC voltage level, comprising:

amplifier means for receiving an input signal;

means for developing an offset signal for combination with

the input signal by the amplifier means to provide an output signal at the desired DC voltage level, the signal developing means having a variable time constant and operating, in use, to bring the output signal to the desired DC voltage level in an interval dependent upon the value of said time constant;

a noise detector which is operative, in use, to generate a first control signal representative of the deviation between the actual average absolute value of the output signal voltage during a predetermined interval and a predetermined nominal average absolute value of the output signal voltage during said interval, the signal developing means being responsive to the first control signal to adjust the time constant of the signal developing means;

means for providing a second control signal if the actual DC voltage level of the output signal during said interval exceeds a predetermined threshold value; and

means for responding to said second control signal by inhibiting application of the first control signal to the signal developing means.

4,516,043

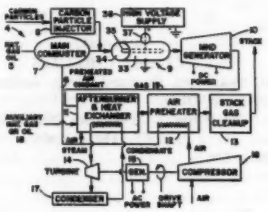
METHOD AND APPARATUS FOR GENERATING ELECTRICAL ENERGY FROM A HEATED GAS CONTAINING CARBON PARTICLES

Samuel A. Vigil, San Luis Obispo, Calif., and Rick B. Spielman, Albuquerque, N. Mex., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 197,550, Oct. 16, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 440,170

Int. Cl.³ H02K *45/00*

U.S. Cl. 310—11 **10 Claims**



1. In apparatus for generating electrical energy having a magnetohydrodynamic generator which produces electrical energy from the kinetic energy of a gas flow by interaction with electrical charge carriers in said flow, a gas source which directs a gas flow into said magnetohydrodynamic generator, and means for entraining carbon particles within said gas flow, the improvement comprising:

means for establishing a gas flow in said magnetohydrodynamic generator having a temperature below the temperature at which thermal ionization of constituents of said gas flow occurs and wherein non-equilibrium ionization is insufficient to provide an adequate amount of said charge carriers within said magnetohydrodynamic generator, and

electrostatic charging means for providing said charge carriers in said gas flow by transferring electrical charge from a source of high voltage to said carbon particles to impart an electrostatic charge thereto as said gas flow travels into said magnetohydrodynamic generator.

4,516,044

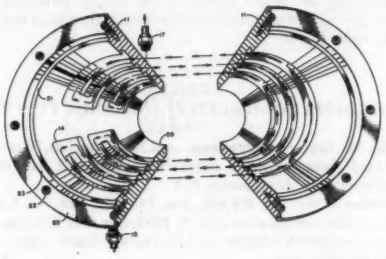
HEAT EXCHANGE APPARATUS FOR ELECTRIC MOTOR AND ELECTRIC MOTOR EQUIPPED THEREWITH

Kendall F. Bone, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 31, 1984, Ser. No. 615,610

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—64 **2 Claims**



1. A heat exchange apparatus for cooling an electric motor comprising a wall defining a cylindrical cavity having a longitudinal axis wherein the wall comprises a continuous path fluid passageway for conveying a heat exchange fluid comprising a plurality of parallel circumferentially incomplete curvilinear passageway segments lengthwise oriented normal to the longitudinal axis connected together at their extremes in pairs by passageway sections lengthwise oriented normal to the passageway segments and parallel to the longitudinal axis, a fluid inlet means communicating with the passageway and a fluid outlet means communicating with the passageway.

4,516,045

ELECTRIC POWER MACHINE WITH PROTECTION AGAINST OVERSPEED

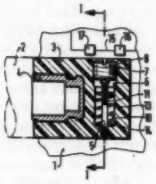
Erich Borst; Fritz Schädlich, and Manfred Stäbler, all of Leinfelden-Echterdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 610,238

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323059

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—68 E **4 Claims**



1. An electric power machine having a housing enclosing the shaft of a driving electric motor, a power supply conduit for the motor and a centrifugal mechanism for protecting the machine against excessive rotary speed by severing the power supply conduit, the protecting mechanism comprising

a centrifugal severing blade in the form of a frame having two opposite bases defining a longer side and s shorter side, and a central opening between the bases;

a diametrical through bore in the driving shaft for slidably guiding the severing blade along a central axis;

a cylindrical blind bore formed in the driving shaft coaxially

with the center axis of the through bore, the blind bore having a diameter which is larger than the shorter side but smaller than the longer side of the base of the severing blade;

a setting screw engaging an upper part of the blind bore above the severing blade;

a helical spring arranged in the center opening of the severing blade and resting on the bottom of the blind bore for biasing the severing blade against the setting screw; and

a power supply conduit extending along the driving shaft opposite the through bore at such a distance that in the case of overspeed the severing blade is displaced by centrifugal force in the range of the conduit to interrupt the same.

4,516,046

CONTINUOUS CURRENT ELECTRIC MACHINE WITH CYLINDRICAL AIR GAP AND PERMANENT MAGNET POLE PIECE

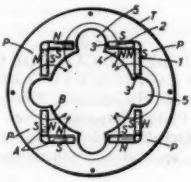
Rene Mercier, Dijon, France, assignor to CEM Compagnie Electro-Mecanique, Paris, France

Continuation of Ser. No. 404,409, Aug. 2, 1982, abandoned. This application Oct. 9, 1984, Ser. No. 659,031

Claims priority, application France, Aug. 6, 1981, 81 15289

Int. Cl.³ H02K *21/26*

U.S. Cl. 310—154 **7 Claims**



1. A continuous current electric machine with a cylindrical air gap and with permanent magnet stator excitation comprising:

a plurality of stacked sheets of magnetic metal forming the stator of the continuous current machine, said sheets having closed cut-outs of a polygonal contour extending therethrough such that the magnetic material completely surrounds each cut-out, and grooves separating adjacent cut-outs from one another and defining poles in the sheets, the polygonal contour of each closed cut-out extending into the immediate proximity of at least one of two ends of an effective region of a pole forming the air gap and leaving only a very narrow strip of the magnetic sheet material between the cut-out and the air gap; and

at least one magnetic plate for insertion in each cut-out to thereby form a permanent magnet pole.

4,516,047

ELECTRIC MOTOR WITH TWO DIRECTIONS OF ROTATION AND SHIFTABLE BRUSHES

Jean Duverger, Saint Pierre de Bressieuse, France, assignor to Black & Decker, Inc., Newark, Del.

Filed Apr. 18, 1984, Ser. No. 601,588

Claims priority, application France, Apr. 20, 1983, 83 06460

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—230 **15 Claims**

1. An electric motor, comprising:

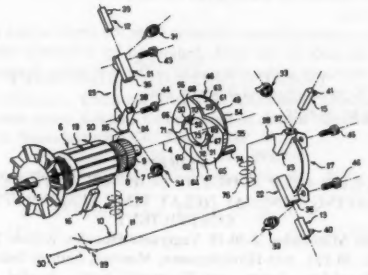
a stator;

an armature having a commutator, said armature being rotatable relative to said stator about an axis, said relative rotation being in either direction and determining the direction of rotation of the motor;

means for selecting the direction of rotation of the motor;

two pairs of brushes, one pair contacting said commutator in one direction of rotation of the motor, and the other pair being angularly displaced about said axis from said one pair and contacting said commutator in the opposite direction of rotation of the motor;

means for moving said other pair of brushes out of contact with said commutator when said one direction of rotation is selected, and for moving said one pair of brushes out of contact with said commutator when said other direction of rotation is selected;



said brush moving means comprising a cam rotatable about said axis;

said brushes having projections which are engageable by said cam for moving the respective pairs of brushes away from said commutator; and

said cam comprising two diametrically opposed lobes symmetrically disposed with respect to said axis.

4,516,048

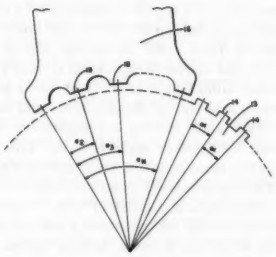
STATOR WITH NONUNIFORMLY SPACED TEETH FOR ROTATING ELECTROMAGNETIC DEVICE

Robert N. Brigham, Monroe, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Sep. 29, 1983, Ser. No. 536,839

Int. Cl.³ H02K *1/12*

U.S. Cl. 310—254 **16 Claims**



1. In an electromagnetic device of the type in which there is a rotor and a stator having toothed, electromagnetically coacting peripheries, the stator having poles and at least one winding comprising coils wound upon the poles to form magnetic poles upon energization of the winding, the improvement comprising having the stator teeth set at nonuniform spacing so that the vector sum of the values determined by the following relationship for each pole is zero:

$$\sum_{n=1}^{n=N} \cos\,(pn_r)\,[a_n - (n-1)a_r - R],$$

where

-continued

$$R = \sum_{n=1}^{n=N} \frac{a_n - (n-1)a_r}{N},$$

$$a_r = \frac{360° \text{ mechanical}}{n_r},$$

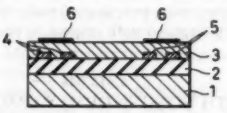
n_r = number of rotor teeth,
N = number of stator teeth on the pole,
$a_1 = 0$,
a_n = center-to-center distance from the tooth at one edge of the pole to the tooth designated by a numeral subscript, the tooth at the other edge of the pole being designated as N, in mechanical degrees, and
p = an integer.

4,516,049

MULTI-LAYER ACOUSTIC SURFACE WAVE DEVICE HAVING MINIMAL DELAY TIME TEMPERATURE COEFFICIENT

Nobuo Mikoshiba, 2-30-18 Yagiyama-Honcho; Kazuo Tsubouchi, 38-151, Aza-Hitokitayama, Moniwa, both of Sendai-shi, Miyagi-ken, Japan, and Kazuyoshi Sugai, Sendai, Japan, assignors to Nobuo Mikoshiba and Kazuo Tsubouchi, both of Sendai, Japan

Filed Sep. 28, 1983, Ser. No. 536,926
Claims priority, application Japan, Oct. 5, 1982, 57-175203
Int. Cl.³ H03H *9/42*
U.S. Cl. 310—313 A **22 Claims**



1. Acoustic surface wave device comprising:
a substrate made of an elastic material having a silicon monocrystal, said silicon monocrystal having a temperature coefficient of delay time for acoustic surface waves which is positive;
a multilayer structure which is disposed on a surface of said substrate and includes a silicon dioxide layer and an aluminum nitride layer, said aluminum nitride layer being formed on said silicon dioxide layer so that a piezoelectric axis of said aluminum nitride layer has a predetermined orientation, said silicon dioxide layer and said aluminum nitride layer each having a temperature coefficient of delay time for acoustic surface waves which is negative, said negative temperature coefficients being substantially equal to and substantially counteracting the effects of said positive temperature coefficient of said substrate; and
first electrode means for generating and second electrode means for detecting acoustic surface waves, said first and second electrode means being formed at predetermined positions on said multilayer structure.

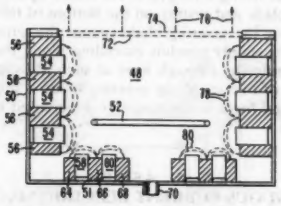
4,516,050

ION CHAMBER FOR ELECTRON-BOMBARDMENT ION SOURCES

Carl J. Russo, Ipswich, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 14, 1982, Ser. No. 397,962
Int. Cl.³ H01J *1/50;* **H05H** *1/00*
U.S. Cl. 313—359.1 **9 Claims**

1. An electron-bombardment ion source comprising:
an ion chamber having electrically conductive chamber walls;
a cathode in said chamber for emitting electrons;
anode means in said ion chamber for accelerating and collecting electrons;
magnetic means in said ion chamber for producing a magnetic field which increases the ionization efficiency of said ion source, said magnetic means comprising an electrically



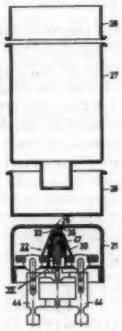
insulating, permanently magnetized material which mechanically supports said anode means and electrically isolates said anode means from said chamber walls;
means for introducing an ionizable gas into said chamber; and
means for accelerating ions out of said chamber.

4,516,051

CATHODE-RAY TUBE AND CATHODE UNIT FOR SUCH A CATHODE-RAY TUBE

Jozef A. M. Hooft van Huijsduijnen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 435,144
Claims priority, application Netherlands, Nov. 18, 1981, 8105222
Int. Cl.³ H01J *29/48, 19/48*
U.S. Cl. 313—446 **5 Claims**



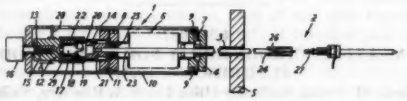
1. A cathode-ray tube comprising an evacuated envelope containing an electron gun for generating an electron beam, said electron gun including a cathode unit comprising a cup-shaped cathode shaft, a filament disposed within said shaft, and connection members to which ends of the filament are welded, said filament comprising a metal wire wound in the form of a first helical spiral which is wound into a second helical spiral having a larger diameter, characterized in that at least one of the first spiral's turns, near each end of the filament and spaced from the connection member to which the respective end of the filament is welded, is formed with a larger pitch than the other turns, and the turns of the first spiral located between the turn with the larger pitch and the respective connection member are filled with the material of the connection member.

4,516,052

DISPENSER FOR ION SOURCE

Phillip D. Prewett, Abingdon; Derek K. Jefferies, Didcot; Neil A. Pashley, Sutton Courtenay, and Thomas D. Cockhill, Newbury, all of England, assignors to Dublier Scientific Limited, Oxfordshire, England

Filed Jun. 1, 1982, Ser. No. 384,321
Claims priority, application United Kingdom, Jun. 2, 1981, 8116841
Int. Cl.³ H01J 17/26; B65D 47/10
U.S. Cl. 313—546 9 Claims



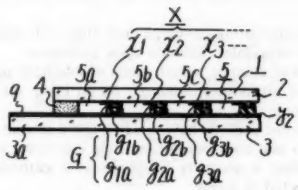
1. A dispenser for ion sources, comprising:
a capsule containing a metal to be ionized, said capsule being breakable to release the metal;
a container for containing said capsule, said container having means for opening said container to introduce the capsule into said container and means for breaking the capsule within said container in order to release the metal;
heating means for heating the metal within said container in order to vaporize the metal; and
conduit means for providing a fluid connection between said container and a reservoir in an associated source into which the metal is to be dispensed.

4,516,053

FLAT PANEL DISPLAY APPARATUS

Yoshifumi Amano, Kamakura, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,586
Claims priority, application Japan, Jan. 13, 1981, 56-3441
Int. Cl.³ H01J 17/49
U.S. Cl. 313—584 4 Claims



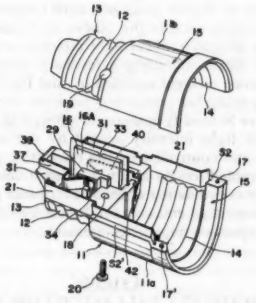
1. A flat panel display apparatus comprising:
first and second insulating plates with at least one of said plates being transparent;
a first plurality of parallel electrodes mounted on one side of said first plate;
a second plurality of parallel electrodes mounted on one side of said second plate and at a predetermined angle other than zero to said first electrodes;
said first electrodes being spaced from and opposed to said second electrodes to define a cross conductor matrix for locating glowing regions;
a plurality of parallel insulating barriers mounted on at least said one side of said first plate and extending parallel with said first electrodes and projecting toward said second plate,
said barriers having the same pattern, pitch and width as said first electrodes;
and a portion of each of said barriers overlapping a respective one side edge portion of one of said first electrodes; and
said first and second plates joined together with their outer edges sealed and gas capable of glowing filled between said plates.

4,516,054

LAMP PROTECTION ARRANGEMENT

Takashi Shikama, Yokaichi; Tomoyuki Yamamoto, Omihachiman, and Atsuo Yokota, Yokaichi, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 30, 1982, Ser. No. 393,794
Claims priority, application Japan, Jul. 31, 1981, 56-115213[U]
Int. Cl.³ H01J 7/44, 17/34, 19/78, 29/96
U.S. Cl. 315—71 15 Claims



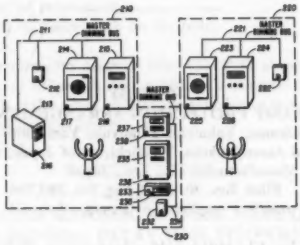
1. A light bulb protection arrangement including a light bulb having a central terminal and a peripheral terminal, a socket having a central terminal and a peripheral terminal, and a junction socket, said junction socket comprising:
a case provided with a base portion and a socket portion, said base portion being screwed into said socket and a base of said light bulb being screwed into said socket portion;
a connecting terminal which extends outside said base portion and inside said socket portion;
a first terminal which is brought into contact with said central terminal of said socket when said base portion has been screwed into said socket;
a second terminal which is brought into contact with said central terminal of said light bulb when said base of said light bulb has been screwed into said socket portion; and
a negative temperature coefficient thermistor having first and second electrodes electrically connected to said first terminal and said second terminal, respectively;
said first terminal, said second terminal and said negative temperature coefficient termistor being provided in said base portion, said thermistor being housed in a space in said base portion of said case, one end of said second terminal being located in said space and being elastically biased into contact with said second electrode whereby when said light bulb is attached to said socket through said junction socket, said peripheral terminal of said light bulb and said peripheral terminal of said socket are connected to said connecting terminal with said central terminal of said socket being connected to said central terminal of said light bulb through said first terminal, said negative temperature coefficient thermistor and said second terminal.

4,516,055

ELECTRONIC DISPLAY DIMMING CIRCUIT

David A. Nelson, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 27, 1983, Ser. No. 499,084
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—151 **5 Claims**



1. A coordinated display brightness control system comprising:

a plurality of digital processor units disposed in a proximal relationship, each to the others, each having an emissive display and an ambient light intensity sensor means, said sensor means including a feedback amplifier having an impedance element coupled to, and further including, an analog-to-digital converter, wherein each display is responsive to modify emissive brightness as a function of the ambient light intensity sensed by the respective sensor means and controlled by the respective digital processor unit coupled to said analog-to-digital converter; and

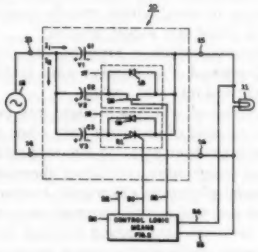
means for coordinating at least two of said plurality of units with respect to emissive brightness by interconnection of said respective impedance elements.

4,516,056

CAPACITIVELY BALLASTED LOW VOLTAGE INCANDESCENT LAMP

Paul T. Coté , Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 379,411, May 18, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 630,360
Int. Cl.³ H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—240 **7 Claims**



1. A ballast means controlling power from an alternating current source to an incandescent lamp, having a filament, at a voltage magnitude that is less than the alternating source voltage comprising:

(a) a first capacitive element electrically serially connected to said lamp which together are across the ballast means input terminal;

(b) at least one auxiliary capacitive element

(c) a control means connected across the filament of said lamp generating discrete control signals in response to conditions of the current flowing through the filament; and,

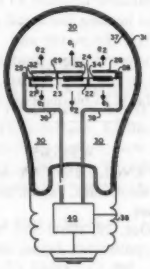
(d) transistor switching means capable of operating at a temperature of at least 130° C., responsive to said control means so as to be rendered conductive for one or more complete cycles of alternating current in response to said control signal, for selectively and individually electrically connecting each auxiliary capacitive element in parallel across said first capacitive element, wherein each auxiliary capacitive element has serially connected thereto a switching means comprising a unidirectional conducting device connected electrically in parallel with an active switching device.

4,516,057

MULTI-ELECTRODE ARRAY FOR A BEAM MODE FLUORESCENT LAMP

Joseph M. Proud, Wellesley Hills; Leslie A. Riseberg, Sudbury; Wojciech W. Byszewski, Arlington, and A. Bowman Budinger, Westford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1982, Ser. No. 337,048
Int. Cl.³ H05B *41/16, 41/24*
U.S. Cl. 315—260 **9 Claims**



1. A multi-electrode beam mode fluorescent lamp comprising:

a light transmitting envelope enclosing a fill material which emits ultraviolet radiation upon excitation;

a phosphor coating, which emits visible light upon absorption of ultraviolet radiation, on an inner surface of said envelope;

a thermionic cathode having a first and a second end located within said envelope for emitting electrons, said cathode including a plurality of thermionic cathode segments connected in series;

a plurality of anodes including an initial anode, at least one intermediate anode and a final anode, each of said anodes located within said envelope for accelerating electrons and simultaneously forming corresponding first and second pluralities of electron beams in response to a voltage applied between said anodes and said cathode, each of said anodes being spaced apart from said cathode by a distance which is approximately less than the electron range in said fill material and having a structure which permits said electron beams to pass thereby;

said initial anode being L-shaped and connected to said first end of said cathode and extending under a first cathode segment of said plurality;

said final anode being L-shaped, said final anode connected to said second end of said cathode and extending opposite to said initial anode;

said intermediate anode being T-shaped with first and second horizontal members, each of said intermediate anodes connected to one of said series connections of said cathode segments, said first horizontal member of each of said

intermediate anodes extending over and to one of said series connected cathode segments and said second horizontal member extending over and to a next sequential of said series connected cathode segments;

each successive said intermediate anode having said first horizontal member oriented in spaced relationship with said cathode segment and opposite to said previous intermediate anode, and having said second horizontal member oriented in spaced relationship with said next sequential cathode segment and opposite to said previous intermediate anode;

a plurality of first and second drift regions, each located within said envelope through which said first and said second pluralities electron beams drift after passing through said plurality anodes, each of said drift regions having a dimension in the direction of travel of said respective electron beam which is greater than the electron range in said fill material, so that the electrons in each of said electron beams collide with the atoms of said fill material in said respective drift region, thereby causing excitation of a substantial portion of said fill material atoms and emission of ultraviolet radiation and causing ionization of another substantial portion of said fill material atoms and emission of secondary electrons, said secondary electrons causing emission of additional ultraviolet radiation and resulting in a substantial amount of visible light;

said electron beams being simultaneously produced in both said first and said second plurality of said drift regions;

a power source external to said envelope; and

means for connecting said cathode and each of said anodes to said power source.

4,516,058

LINEARITY CORRECTED HORIZONTAL DEFLECTION CIRCUIT

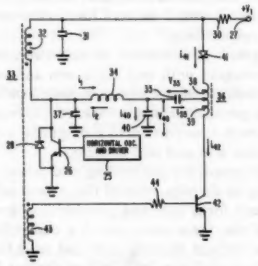
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,516

Claims priority, application United Kingdom, May 11, 1981, 8114334

Int. Cl.³ H01J *29/56*

U.S. Cl. 315—370 **11 Claims**



1. A linearity-corrected deflection circuit comprising;

a deflection winding;

first switching means switched at a deflection rate and coupled to said deflection winding;

a capacitance coupled to said deflection winding and responsive to the switching of said first switching means for generating a deflection current in said deflection winding which defines a trace and retrace interval during a deflection cycle;

a source of voltage;

an inductance coupled to said voltage source and having first and second windings magnetically coupled to each other; and

second switching means coupled to said inductance and to said capacitance for switching current from said capacitor alternately between said first and said second windings in order to provide substantial linearity correction to said deflection current, whereby the magnetic coupling between said first and second windings permits said current switching between said first and second windings to occur during significant levels of current flow in one of said first and second windings such that substantially instantaneous current switching occurs at all levels of current flow.

4,516,059

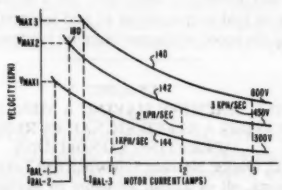
MOTOR CONTROL CHOPPER APPARATUS PHASE ANGLE LIMITING

Richard D. Roberts, South Park Township, Allegheny County; James H. Franz, Jr., Murrysville; Lester J. Hoffman, Churchill Borough, and Lalan G. Miller, Forest Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1981, Ser. No. 265,019

Int. Cl.³ H02K *27/20*

U.S. Cl. 318—301 **7 Claims**



1. In motor control apparatus operative with a power supply voltage including a chopper having a phase angle of operation and coupled with a vehicle propulsion motor having a first motor operation curve determined by said power supply voltage, said vehicle having a control device providing an effort request signal with a range of values and determining the desired movement of the vehicle, the combination of

means responsive to said effort request signal for determining a desired acceleration rate for said vehicle,

means responsive to said effort request signal within said range for establishing a phase angle limit for the chopper in accordance with a predetermined relationship to said effort request signal,

means responsive to the phase angle limit for establishing a voltage limit for said motor, and

control means coupled with said chopper and responsive to the effort request signal and the established motor voltage limit for providing for said motor a second motor operation curve for determining the desired movement of said vehicle.

4,516,060

DIGITAL MOTOR SPEED CONTROL

Nahum Guzik, 224 Lassen Ave., Mountain View, Calif. 94043, and Gennady Mangeym, 2564 Downing Ave., San Jose, Calif. 95126

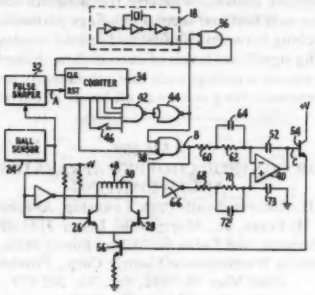
Filed Nov. 19, 1982, Ser. No. 443,116

Int. Cl.³ H02P *5/06*

U.S. Cl. 318—341 **4 Claims**

1. Apparatus for controlling the speed of a motor to a desired value, comprising; encoding means for generating a succession of indicator pulses, each pulse having a period T related to the rotational speed of the motor; a pulse burst generator responsive to each of said indicator pulses for generating a predetermined pattern of n pulses such that the sum of their widths $t_1 = t_2 \ldots t_n$ is directly related to a given value for T_0 corresponding to a desired speed of said motor; means for integrating said n pulses over said given period T relative to a reference signal to generate an output signal, including a differential integrator having the output of said pulse burst generator

as its first input and the logically inverted output of the pulse burst generator as its second input, said output signal being the



output of said differential integrator; and a motor drive circuit responsive to said output signal of said integrating means for controlling the speed of the motor to the predetermined speed.

4,516,061

SEWING MACHINE HAVING A MEMORY FOR GENERATING A SPEED SIGNAL IN RESPONSE TO OPERATING CONDITIONS

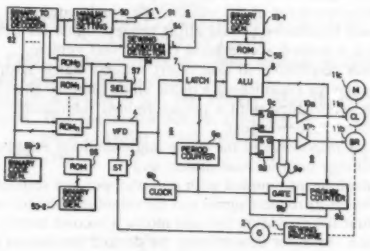
Shigeo Neki, Osaka; Nozomu Shinozaki, and Takashi Dohi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 7, 1982, Ser. No. 386,784

Claims priority, application Japan, Jun. 10, 1981, 56-89044; Jun. 10, 1981, 56-89045; Jun. 11, 1981, 56-89872

Int. Cl.³ G05B *19/42*

U.S. Cl. 318—561 **10 Claims**



1. A sewing machine having a motor for transmitting its motive power to a drive shaft of the sewing machine under various operating conditions in accordance with the position of a manually operated pedal, comprising in a closed loop:

tachogenerator means for generating pulses at a frequency proportional to the speed of the sewing machine;

position detecting means for detecting the position of said manually operated pedal and generating therefrom a position indicating signal;

manually adjustable signal generating means for generating a first and a second speed range indicating signal when the sewing machine is to be operated at a speed in a first and a second speed range, respectively;

memory means for storing speed control signals respectively in locations addressible as a function of said position indicating signal and as a function of said first and second speed range indicating signals; and

means for processing the pulses generated by said tachogenerator means to control the amount of the motive power of said motor transmitted to the sewing machine in accordance with the speed control signal addressed from said memory means.

4,516,062

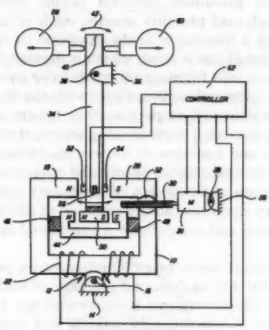
ACTUATOR

Carlo La Fiandra, New Canaan, and Peter B. Mumola, Huntington, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 27, 1983, Ser. No. 545,985

Int. Cl.³ G05B *19/36*

U.S. Cl. 318—676 **14 Claims**



1. An actuator comprising, in combination:

a housing mounted for movement on fixed base means, said housing being fabricated from magnetic material and being configured to have two spaced pole faces of opposite polarity;

a housing coil mounted on said housing to form an electromagnet in combination with said housing;

means having infinite reflected inertia for moving said housing;

a force arm mounted for movement on fixed base means, one portion of said force arm having an output drive pick-off and another portion of said force arm being disposed between the pole faces of said housing;

pole pieces mounted on said force arm adjacent said pole faces, respectively;

a force arm coil mounted on said force arm to form an electromagnet with said force arm and said pole pieces;

first permanent magnet means mounted on said housing and second permanent magnet means mounted on said force arm which coact to form a magnetic coupling between said force arm and said housing;

controller means for controlling said means for moving said housing to thereby control the course adjustment output from said force arm and provide low frequency integration of the force arm; and for controlling the flow of current to said housing coil and said force arm coil to provide a net force greater than the net force of the two permanent magnets thereby controlling the fine adjustment output from said force arm.

4,516,063

CONTROL APPARATUS

Arthur Kaye; Brian Carr, and Philip A. Latham, all of Lancashire, England, assignors to British Aerospace Public Limited Company, London, England

Filed Jan. 24, 1983, Ser. No. 460,559

Claims priority, application United Kingdom, Jan. 22, 1982, 8201907

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—685 **4 Claims**

1. A control device for enabling an operator to control

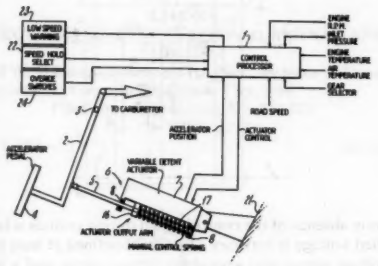
associated apparatus to which, in use, the control device is connected, the control device comprising:

a fixed support member;

a control member supported by the support member and movable with respect thereto by said operator;

output means connected to the control member and operable for transmitting to said associated apparatus control signals indicative of the position of said control member relative to the support member;

an electrical stepper motor of which the stator part is connected to said support member and the mover part is connected to said control member;



motor energization means which is connected to said stepper motor and which is operable for energizing said motor to generate, at least while said control member is at one or more discrete positions in its range of movement relative to the support member, an attractive force between the stator and mover parts of the motor tending to resist manual movement of the control member; and

transducer means connected to said motor energization means and operable to sense at least one physical parameter affecting said associated apparatus and for causing said motor energization means to change said attractive force in depedence upon said at least one parameter.

4,516,064

STEPPER MOTOR CONTROL DEVICE

Claude Oudet, and Danielle Régnier, both of Besancon, France, assignors to Portescap, La Chaux-de-Fonds, Switzerland

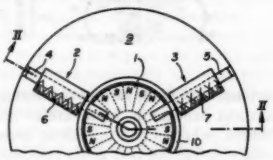
Filed Feb. 15, 1983, Ser. No. 466,542

Claims priority, application Switzerland, Feb. 16, 1982, 958/82

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—696 **3 Claims**



1. A control device for a diphase or polyphase stepper motor of the type comprising a permanent magnet rotor and at least two separate magnetic stator circuits each coupled with at least one electric coil (b_i, b_j), said control device comprising a source of electrical energy (V) adapted to be connected through a commutation circuit (CC) to the respective coils of each of the said separate stator circuits for supplying said coils with current pulses, a pulse generator circuit (PG) controlled by a clock signal source (G_1) for providing programmed control pulses (S_1 to S_4) being part of at least one programmed pulse series, a detection circuit (CD) at least one input of which is adapted to be connected through the said commutation circuit to the respective coils of each of the said separate stator circuits, said detection circuit comprising at least one integrating circuit (I) provided with a reset device (RS), at least a first comparator circuit (C_3) for comparing, at least temporarily, the output signal (C_3) of the said integrator circuit with a first position reference value (U_3) and providing a corresponding output signal, and a logic control circuit (CL_1, CL_2, CL_3) connected by its inputs to said clock signal source, to said pulse generator circuit and to the outputs of said detection circuit, said logic control circuit being arranged to supply through its outputs commutation control signals (D_1 to D_4, D_6 to D_{13}) to the inputs of said commutation circuit and detection control signals (rs, $Q_6+\overline{Q}_1$) to said detection circuit, said detection circuit further comprising at least a second comparator circuit (C_1) for comparing, at least temporarily, a speed signal (e_2) provided by said electric coils with a speed reference value (U_1), said logic control circuit being further arranged to control the commutation circuit in accordance with said output signals of said comparator circuits so as to supply at determined times driving current pulses of determined duration to the motor in accordance with a desired mode of operation of the motor.

4,516,065

CONTROL APPARATUS FOR AC MOTORS

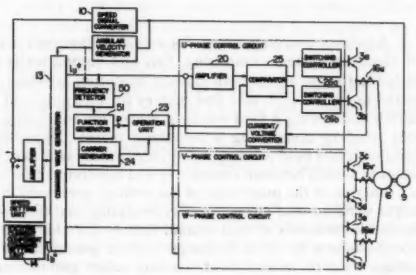
Hisakazu Ninomiya; Satoshi Ibori, both of Funabashi; Hiroshi Nagase, Hitachi; Sadayuki Igarashi, Funabashi, and Hiroshi Sugai, Sakura, all of Japan, assignors to Hitachi, Ltd. and Hitachi Keiyo Eng. Co., Ltd., both of Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,101

Claims priority, application Japan, Sep. 7, 1982, 57-154526; Sep. 7, 1982, 57-154527

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—811 **22 Claims**



1. A control apparatus for an AC motor in which the AC motor is connected to the output side of a pulse width modulation inverter, said apparatus comprising:

command wave generator means for producing an AC waveform of variable frequency;

current detection means for detecting the primary current of said AC motor;

operation means for producing a signal representative of the difference between the output of said command wave generator means and the output of said current detection means;

carrier signal generator means for generating a carrier signal;

pulse width modulation means receiving the outputs of said carrier signal generator means, said operation means and said command wave generator means and producing width modulated pulses by comparing one of the outputs of said carrier signal generator means and said operation

means with the other output after controlling the amplitude of at least one of the outputs of said carrier signal generator means and said operation means by a signal relating to the output of said command wave generator means; and

switching control means receiving the output of said pulse width modulation means, for controlling conduction of main switching elements of said pulse width modulation inverter;

said pulse width modulation means including:

an amplitude control circuit for changing the amplitude of the output of said carrier signal generator means according to a signal relating to the output frequency of said command wave generator means to produce a resultant output signal; and

comparator means for comparing the output of said amplitude control circuit with the output of said operation means to produce said width modulated pulses.

4,516,066

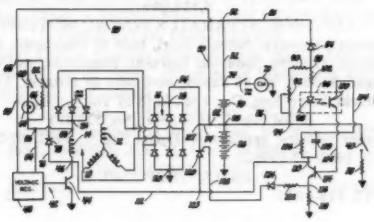
DUAL-VOLTAGE BATTERY CHARGING SYSTEM

Robert J. Nowakowski, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 29, 1983, Ser. No. 518,669

Int. Cl.³ H02J 7/14

U.S. Cl. 320—15 **6 Claims**



1. A battery charging system for a dual-voltage motor vehicle electrical system comprising, first and second series-connected batteries, a generator having an output winding connected in circuit with said first battery for charging said first battery and having a field winding, means for energizing said field winding comprising a switching means connected in series with said field winding, means for causing said switching means to switch between conductive and nonconductive states as a function of the magnitude of the voltage generated in said output winding, and circuit means connecting said field winding to the terminals of said second battery for charging said second battery by field discharge current produced by the voltage induced in said field winding when said switching means is switched to a nonconductive state.

4,516,067

REGULATED POWER SUPPLY WITH CURRENT REGULATING CIRCUIT

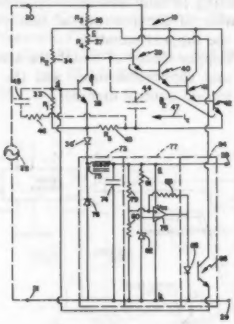
Philip A. Hoffman, Towson, Md., assignor to Solid State Chargers Research and Development Limited Partnership, Lutherville, Md.

Continuation-in-part of Ser. No. 524,356, Aug. 18, 1983, , which is a continuation-in-part of Ser. No. 472,758, Mar. 7, 1983, Pat. No. 4,504,774. This application Feb. 29, 1984, Ser. No. 584,607

Int. Cl.³ G05F 1/44

U.S. Cl. 323—265 **26 Claims**

1. A power supply comprising rectifying circuit means for supplying unfiltered rectified voltage, circuit means for producing current pulses and smoothing circuit means for providing D.C. voltage output connected in series, and D.C. voltage output sensing means coupled to said smoothing circuit and responsive to the D.C. voltage output for producing a control signal whenever the D.C. voltage output reaches or exceeds at least a given level, said circuit means for producing current pulses being responsive to the control signal and to instant amplitude of the unfiltered rectified voltage to block current pulses to said smoothing circuit whenever the control signal is present and to pass current pulses to said smoothing circuit



means in absence of the control signal during periods when the rectified voltage is between a first level defined at least in part by voltage across said smoothing circuit means and a higher second level and to block current pulses to said smoothing circuit means during periods when the rectified voltage is greater than the second level.

4,516,068

TIRE DEFECT TESTER

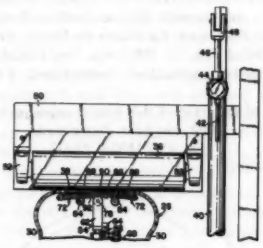
Raymond P. Hawkinson, Jr., Minneapolis, and Dennis W. Newman, Saint Paul, both of Minn., assignors to Paul E. Hawkinson Company, Minneapolis, Minn.

PCT No. PCT/US82/00479, § 371 Date Apr. 18, 1983, § 102(e) Date Apr. 18, 1983, PCT Pub. No. WO83/03681, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 16, 1982, Ser. No. 488,760

Int. Cl.³ G01R 31/12

U.S. Cl. 324—54 **6 Claims**



1. In combination with apparatus for testing tires for structural defects and damage in the nature of holes in the tread portion thereof, wherein the apparatus includes means for mounting and rotating the tire, and a rotatable first electrode engagable with the outer tread portion of the tire:

(a) a second electrode movable between a first position within a circumference defined by the tire beads and a second position engaging an underside of the tread portion, comprising:

(i) an elongated member having a pivot bifurcating said member into first and second arm portions;

(ii) means mounting said member for rotation about said pivot; and

(iii) means normally biasing said member to an orientation spaced at an oblique angle relative to the tread portion

with said first arm portion more closely proximate the underside of the tread portion than is said second arm portion;

(iv) wherein, as said second electrode is moved from its first position to its second position, said first arm portion engaging the underside of the tread portion of the tire causes said elongated member to rotate about said pivot until said member is in engagement, along its full dimension along its axis of elongation, with the underside of the tread portion; and

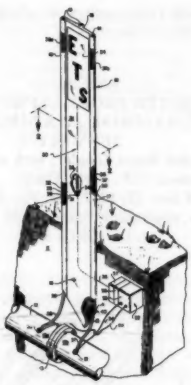
(b) means generating an electrical potential across said first and second electrodes.

4,516,069

ELECTROLYSIS TEST STATION TERMINAL AND SUPPORT

Donald W. Schmanski, Carson City, Nev., assignor to Carsonite International Corporation, Carson City, Nev.

Filed Apr. 4, 1983, Ser. No. 481,721
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—71.1 **15 Claims**



1. An electrolysis test station terminal support for use in connection with measurement of voltage difference and/or current flow between an underground pipe and ground potential, said terminal support comprising:

a single, elongated, unitary structure formed of an impact-resistant, flexible, resilient, electrically nonconductive plastic material and having sufficient length and rigidity to enable implacement of a bottom portion of said structure below ground level and a top portion thereof above ground level in a stable, vertical orientation;

said structure being substantially comprised of a thin web section along its length to improve flexibility and having a width greater than approximately 5.0 cm to provide sufficient surface area for attachment of identification means at the top portion thereof;

said structure further including at least one longitudinal rib integrally formed as part of the single unitary structure and extending from the top portion to the bottom portion, said rib having a hollow core whose diameter is sufficiently large to house a conductive wire adapted for use as connecting wire to the underground pipe; and

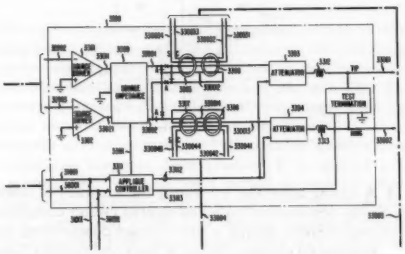
said longitudinal rib having sufficient wall thickness around said core to maintain the longitudinal rigidity and impact-resistance of the elongated structure, said wall structure including an opening in the bottom portion thereof to permit insertion of the conductive wire into said core, and further having an opening in the top portion of said wall structure to provide physical access to said wire when inserted therein to enable contact for voltage or current measurement.

4,516,070

MAGNETIC CURRENT SENSOR WITH OFFSET AND LOAD CORRECTION

James M. Brown, Chatham, and Kyran B. Kemper, Mendham, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,174
Int. Cl.³ G01R *19/00, 1/02;* H04M *3/26*
U.S. Cl. 324—117 R **7 Claims**
MICROFICHE APPENDIX INCLUDED
(17 Microfiche, 1042 Pages)



1. Circuitry (**3300,3400**) for measuring, over a predetermined frequency band (e.g., DC-3200Hz), current (I_L) supplied by a source (**3200**) to the input port (e.g., TIP) of a network (e.g., **180**), said circuitry comprising

a pair of substantially identical cores (e.g., **3307,3308**), each having line (L_1, L_2), sense (S_1, S_2) and control (C_1,C_2) windings,

said control windings being supplied with pulses (I_C) to produce magnetic fields of opposing orientations in said cores,

said sense windings, during periods of said pulses, being supplied with a sense signal (I_S) to produce magnetic intensities aiding one and opposing the other of said fields, and during intervals between said pulses, is connected to means (**34021,34024**) for cumulatively integrating the induced voltage to produce said sense signal, said cumulative voltage being proportional to said current after a preselected time period,

said line windings being serially connected to said source and each arranged to produce a field strength to oppose corresponding ones of said intensities,

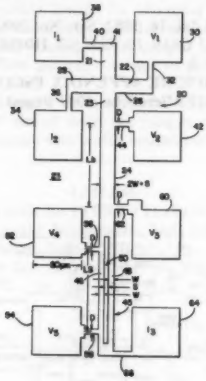
buffer circuit means (e.g., **3309,3310,3312**), serially connected with said line windings and said input port, for providing a low impedance relative to the input impedance of said port over said band and a high impedance relative to said input impedance at the rate (e.g., 50 kHz) of said pulses, and

calibrate means (**3309,3310,34025,34026**) for determining a calibrate signal to correct for offsets in said circuitry during measurements, said calibrate signal being coupled to said sense windings and having a value proportional to said cumulative voltage obtained by replacing said network and said source with a calibrate load.

4,516,071
SPLIT-CROSS-BRIDGE RESISTOR FOR TESTING FOR PROPER FABRICATION OF INTEGRATED CIRCUITS

Martin G. Buehler, La Canada, Calif., assignor to The United States of America as represented by the Administration of the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 26, 1982, Ser. No. 402,205
Int. Cl.³ G01R *31/00, 27/02*
U.S. Cl. 324—158 R **10 Claims**



1. A testing apparatus for testing the accuracy of fabrication of circuit components on an integrated circuit comprising:

a cross resistor having a first voltage contact pad and first and second current contact in electrical contact therewith;

a bridge resistor electrically connected at one and thereof to the cross resistor and having first and second bridge resistor voltage contact pads in electrical contact therewith;

a split-bridge resistor having first and second split conductor channels electrically connected to the other end of the bridge resistor and having first and second split conductor voltage contact pads electrically connected to the first split conductor channel, with the second split conductor channel spaced apart from the first; and,

a current contact pad in electrical contact with the junction of the split conductor channels at the end thereof remote from the bridge resistor.

4,516,072
DEVICE FOR USE IN TESTING PRINTED CIRCUIT BOARD COMPONENTS

Gary R. Marpoe, Jr., Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

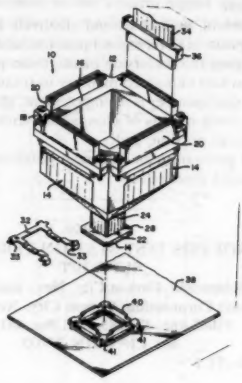
Filed Nov. 22, 1982, Ser. No. 443,358
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—158 F **2 Claims**

1. A device for use in testing and analyzing circuits and electronic components on a printed circuit board and used in conjunction with an active device substrate connector mounted on the board and having a recess with contact elements therein, said device comprising:

a. an elongated housing having flexible film strip connectors at one end and plate attachment means at the other end;

b. a plate for being received in the recess in the connector and attached to the other end of the housing and having four sides defined by a central opening; and

c. four flexible film strips having conductive traces thereon extending from one end to another, one end of the film strips being terminated in the connectors at one end of the housing and the other ends being secured to the sides of the plate with the conductive traces facing away from the plate and housing so that with the plate positioned in the recess, the conductive traces on the film strips engage the contact elements to transmit signals from the board to

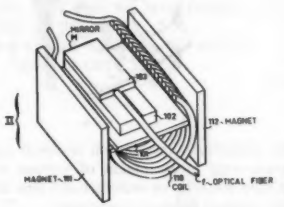


testing and analyzing equipment which may be connected to the film strip connectors.

4,516,073
MAGNETOMETER PROBE USING A THIN-FILM MAGNETIC MATERIAL AS A MAGNETO-OPTIC SENSOR

Gérard Doriath, and Roger Gaudry, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 27, 1982, Ser. No. 424,617
Claims priority, application France, Dec. 4, 1981, 81 22745
Int. Cl.³ G01R *33/02*
U.S. Cl. 324—244 **14 Claims**



1. Measuring head for a magnetometer comprising:

a plane layer of a magnetic material;

laser diode means for producing a beam of linearly polarized light, said linearly polarized light beam directed to said plane layer for guided propagation of said beam within said plane layer parallel to the plane surfaces of said plane layer, said beam undergoing a rotation of the direction of polarization during said guided propagation within said plane layer;

photodiode means for measuring said rotation of the direction of polarization;

a common optical fibre for coupling said beam to a proximate edge of said plane layer;

said plane layer comprising an extremity opposite said proximate edge at which is provided a means for reflecting the beam so as to cause the beam to travel outwards and back within the magnetic material plane layer before reinjection into the common optical fibre and transmission to the means for measuring the rotation of the direction of polarization; and

optical means having a preferential optical axis, for coupling

said laser diode means and said photodiode means, comprising,

means for linearly polarizing the beam transmitted and inserting the linearly polarized beam into the common optical fibre,

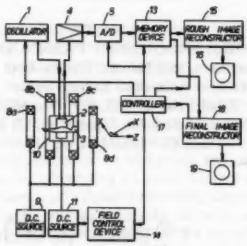
means for receiving from the common optical fibre the beam retransmitted by the magnetic material layer, and,

means for separating the beam received into two components having polarizations which are respectively parallel and orthogonal to the said preferential optical axis and transmitting the orthogonal component to the photodiode means.

4,516,074
NUCLEAR MAGNETIC RESONANCE DIAGNOSTIC APPARATUS

Hiroshi Sugimoto, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 31, 1982, Ser. No. 413,425
Claims priority, application Japan, Aug. 31, 1981, 56-135424
Int. Cl.³ G01N *27/00*; A61B *5/05*
U.S. Cl. 324—309 **8 Claims**



1. Nuclear magnetic resonance diagnostic apparatus wherein a uniform static magnetic field is generated, a first gradient magnetic field is superimposed on said static magnetic field in the direction of said static magnetic field, a second gradient magnetic field is superimposed on both said static magnetic field and said first gradient magnetic field in a direction perpendicular to said magnetic field direction, and the gradient direction of said second gradient magnetic field is rotationally shifted through a plurality of steps substantially equal to 360 degrees divided by some unit index angle rotated to acquire a tomographic image on the basis of nuclear magnetic resonance signals due to specified atomic nuclei existing within a slice of an object, the apparatus comprising:

coil means for generating said second gradient magnetic field;

means for controlling the operation of said coil means to rotationally shift in angular steps the gradient direction of said second gradient field in a slice of an object to be diagnosed where said angular step is a multiple of said index angle in a sequence to assume all of the gradient direction positions of said second gradient field;

a memory device for storing nuclear magnetic resonance signals for each gradient direction of said second gradient magnetic field;

a rough image reconstructor for reconstructing a rough tomographic image on the basis of nuclear magnetic resonance signals acquired during a rotation of the gradient direction of said second gradient magnetic field;

a rough image display for depicting said rough tomographic image;

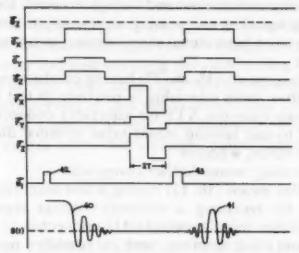
a final image reconstructor for reconstructing a final tomographic image on the basis of nuclear magnetic resonance signals corresponding to all of the expected rotational shift positions acquired during a plurality of rotations; and

a final image display for depicting said final tomographic image.

4,516,075
NMR SCANNER WITH MOTION ZEUGMATOGRAPHY

Paul R. Moran, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 4, 1983, Ser. No. 455,596
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—309 **16 Claims**



1. In a gyromagnetic resonance instrument which performs a measurement cycle by applying a transverse excitation signal to a gyromagnetic material and to thereby impart a transverse magnetic moment thereto, and which produces a FID signal responsive to emissions by the transversely magnetized gyromagnetic material, the improvement comprising:

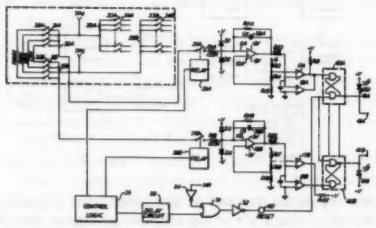
means for motion sensitizing a FID signal in which a motion sensitizing magnetic field gradient F is applied to the gyromagnetic material for a period of time 2T after its transverse excitation and prior to the production of the FID signal, and wherein the motion sensitizing magnetic field gradient F has alternating polarity with respect to the gyromagnetic material such that its integral over the time period 2T is substantially zero; and

detector means for receiving the FID signal and producing therefrom a signal $S_1(t)$ which is phase-referenced to the cosine phase of the transverse excitation signal and a signal $S_2(t)$ which is phase-referenced to the sine phase of the transverse excitation signal.

4,516,076
FAULT DETECTION ARRANGEMENT FOR RELAY SWITCHING SYSTEM

Joseph C. Pillari, Little Ferry, and Arthur W. Willging, East Rutherford, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sep. 17, 1982, Ser. No. 419,333
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—418 **5 Claims**



1. A fault detecting arrangement in an automatic test system (ATS) for detecting a fault condition on a plurality of relays in a bank of relays in the ATS, the relays each having first and second terminals for forming respective conductive paths therebetween in response to relay control signals, the first

terminals of the relays being connected to each other to form a relay bus, the second terminal of at least one of the relays having means for connection to an input of a test instrument, and the second terminals of selected others of the relays having means for connection to respective test points of a unit under test (UUT), the fault detecting arrangement further comprising:

sensing means (**10, 11, 12, 13,** R_F, **17, 18, 19, 20**) having sensing means input and output terminals for producing a fault signal at said sensing means output terminal responsive to an input signal at said sensing means input terminal; and

coupling means (**35, 36, 37**) having conductive and nonconductive states selectable in response to test mode control signals from the ATS for selectably connecting the relay bus to said sensing means input terminal during conductive states, wherein

said sensing means further comprises:

amplifier means (**10, 12**) having a first amplifier input terminal for receiving a reference voltage signal, a second amplifier input terminal (**11**) connected to said sensing means input terminal, and an amplifier output terminal (**13**) for producing a signal responsive to a bus signal on said relay bus and said reference voltage signal; and

feedback means (R_F) connected across said second amplifier input and said amplifier output terminals, and wherein

said feedback means (R_F) forms a discharge path when said coupling means is in said conductive state for discharging the relay bus, and wherein

said sensing means further comprises threshold detector means (**17, 18**) having a first detector input terminal connected to said amplifier output terminal, a second detector input terminal for receiving a threshold value, and a detector output terminal (**19, 20**) connected to said sensing means output terminal, and wherein

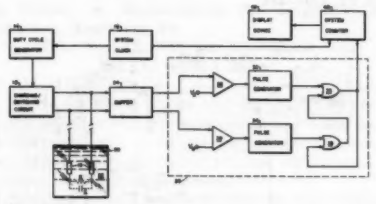
there is further provided latch means (**40A, 40B**) connected to said sensing means output terminal for receiving said fault signal, said latch means further having a latch output terminal (**41A, 41B**) for producing an interrupt signal for the ATS which disables the relay control signals.

4,516,077

APPARATUS FOR AND A METHOD OF MEASURING THE INTRINSIC TIME CONSTANT OF LIQUIDS

David B. Fenneman, Fredericksburg, Va.; Larry F. Rinehart, Albuquerque, N. Mex., and Leonard W. Hardesty, Jr., King George, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 14, 1983, Ser. No. 504,340
Int. Cl.[3] **G01N** *27/42*
U.S. Cl. 324—425 **9 Claims**



1. An apparatus, termed a "taumeter", for measuring the intrinsic time constant τ of liquids, said apparatus comprising:

a pair of electrodes for immersing in a particular one of said liquids in which the intrinsic time constant τ is to be measured;

first means for operatively connecting a charging voltage level across said pair of electrodes during a first time interval such that the voltage on said pair of electrodes exceeds a predetermined voltage V_A, and for operatively disconnecting the charging voltage level during a second time interval starting at a time after the voltage on said pair of electrodes has exceeded the predetermined voltage V_A;

second means operatively connected to said pair of electrodes and to said first means for comparing the discharging voltage level, attributable to an electrode-liquid system capacitance, C, and resistance, R, to the level of the predetermined voltage V_A and to the level of a predetermined voltage V_B, said second means outputting a gate pulse only when the discharging voltage level lies between the predetermined voltages V_A and V_B which occur at the times T_A and T_B, respectively, during the second time interval, the leading edge of the gate pulse occurring at the time T_A and the trailing edge of the pulse occurring at the time T_B; and

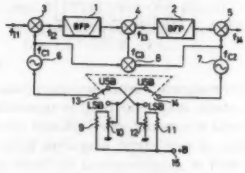
counter means operatively connected at one input to said first means and at another input to said second means for generating a binary number corresponding to the time interval between T_A and T_B, the intrinsic time constant τ of said particular one of said liquids being $\tau=T_B-T_A=RC$.

4,516,078

VARIABLE FREQUENCY PASSBAND CIRCUIT

Masaki Yanagihara, and Takashi Iimura, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Japan

Filed Feb. 4, 1983, Ser. No. 463,848
Claims priority, application Japan, Feb. 15, 1982, 57-18587[U]
Int. Cl.[3] **H03H** *11/02, 11/04*
U.S. Cl. 328—167 **1 Claim**



1. A variable frequency passband circuit comprising:

first and second bandpass filters (e.g., **1, 2**) connected in a cascade fashion for forming a synthetic filter in a signal path,

first and second oscillators (e.g., **6, 7**) for respectively generating first and second frequency signals (e.g., f_{C1}, f_{C2}) which can be varied by control signals applied thereto,

first and second control means (e.g., **11, 12; 9, 10**) for respectively producing said control signals to be applied to said first and second oscillators,

a frequency signal generator (e.g., **8**) for mixing said first and second frequency signals to produce a third frequency signal (e.g., f_{C3}),

a first mixer (e.g., **3**) for mixing an input signal (e.g., f_{I1}) to be applied to the circuit and said first frequency signal to produce a signal which is applied to said first bandpass filter,

a second mixer (e.g., **4**) for mixing an output signal of said first bandpass filter and said third frequency signal to produce a second frequency—converted input signal which is applied to said second bandpass filter,

a third mixer (e.g., **5**) for mixing an output of said second bandpass filter to produce a signal output of the circuit, and

switching means (e.g., **113, 14**) for connecting said first control means to said first oscillator and also said second control means to said second oscillator in a first operation mode, and alternatively connecting said first control means to said second oscillator and also said second con-

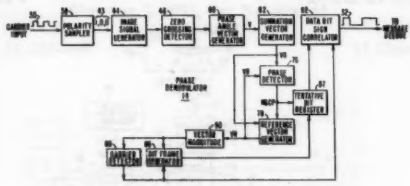
trol means to said first oscillator in a second operation mode.

4,516,079

COHERENT PHASE SHIFT KEYED DEMODULATOR FOR POWER LINE COMMUNICATION SYSTEMS

Theodore H. York, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1983, Ser. No. 465,232
Int. Cl.³ H04L *27/22*
U.S. Cl. 329—104 **22 Claims**



8. Demodulator apparatus for phase shift keyed carrier signals having binary baseband data symbols modulated thereon, said apparatus comprising:

first means for generating a plurality of phase vector signals representative of the phase of overlapping portions of incoming carrier signals, each of said portions extending over a time period equal to a data symobl interval;

second means connected to said phase vector signal generating means for generating a Carrier Detect signal indicative of the presence of a desired incoming carrier signal for use by associated message decode circuits, and for concurrently processing said phase vector signals to generate a synchronization signal to select one of said phase vector signals which corresponds to a single transmitted baseband data symbol; and

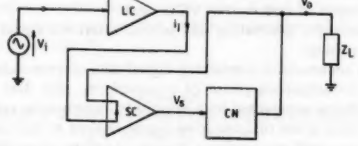
means for processing said selected phase vector signal to determine the transmitted baseband data symbol corresponding thereto.

4,516,080

HIGH-EFFICIENCY LOW DISTORTION PARALLEL AMPLIFIER

Peter Garde, Bronte, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Mar. 30, 1983, Ser. No. 480,365
Claims priority, application Australia, Apr. 1, 1982, PF3423
Int. Cl.³ H03F *21/00*
U.S. Cl. 330—3 **32 Claims**



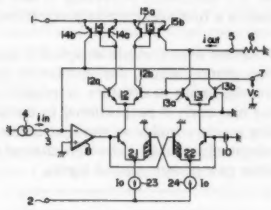
1. A high-efficiency low-distortion parallel regulator system comprising a high-efficiency switching circuit having a control input and an output, a low-distortion linear-amplification means having an output, a coupling network, a coupling node and a system output port, wherein a reference voltage is generated within said linear-amplification means, an output voltage signal which is a function of the reference voltage is produced at the output of the linear-amplification means and is adapted to be fed to a load via the system output port, a signal which is a function of a current flowing in the output of the linear-amplification means is used to control the switching circuit, via the control input and a switching output current flowing in the output of the switching circuit is fed predominantly to the coupling node which is disposed between the output of the linear-amplification means and the system output port, at which node the switching output current is combined with the current flowing in the output of the linear-amplification means to produce a system output current which flows via the system output port to the load, the coupling network being connected so as to limit the maximum time rate of change of the switching output current and said coupling network having high output impedance at high frequencies, and the regulator system being further characterised in that the system output current when averaged over a period of time is substantially supplied by the switching circuit when said averaged output current is large.

4,516,081

VOLTAGE CONTROLLED VARIABLE GAIN CIRCUIT

Masayuki Katakura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,406
Claims priority, application Japan, Oct. 2, 1981, 56-156096
Int. Cl.³ H03G *3/30*; H03F *3/45*
U.S. Cl. 330—254 **12 Claims**



1. A variable gain circuit comprising:

first current divider means including first and second transistors of a first conductivity type producing at least one output signal in response to a control signal;

second current divider means including third and fourth transistors of said first conductivity type producing at least one output signal in response to said control signal;

amplifier means for producing a first signal in response to an input signal and the at least one output signal from said first and second current divider means;

first current source means for producing a first constant current;

second current source means for producing a second constant current;

first differential amplifier means for controlling current flow to said first current divider means in response to said first signal and said first constant current so that steady state currents flowing through said first current divider means are controlled to a value less than one-half of the value of said first and second constant currents;

second differential amplifier means for controlling current flow to said second current divider means in response to said second signal and said second constant current so that steady state currents flowing through said second current divider means are controlled to a value less than one-half of the value of said first and second constant currents;

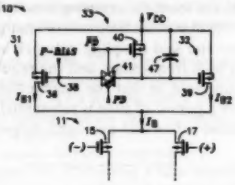
current mirror means receiving said output signals from said first and second current divider means; and

output means for producing an output signal in response to the at least one output signal from said first and second current divider means.

4,516,082
AMPLIFIER CIRCUIT FOR MINIMIZING OUTPUT VOLTAGE POWER-UP TRANSIENTS

Michael D. Smith, Lewisville, and Roger A. Whatley, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1984, Ser. No. 583,064
Int. Cl.³ H03F 3/16
U.S. Cl. 330—296 15 Claims



1. A circuit for minimizing output voltage transients in an operational amplifier resulting from powering up the operational amplifier, said operational amplifier providing an output voltage proportional to a differential between first and second input voltages coupled to a pair of differential input transistors, comprising:

first current source means coupled to the pair of input transistors, for selectively providing to said differential input transistors a first bias current proportional to a bias voltage;

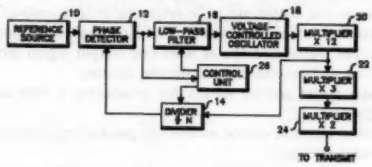
second current source means coupled in parallel to the first current source means, for constantly providing to the differential input transistors a predetermined minimal second bias current proportional to the bias voltage; and

switching means coupled to the first current source means, for selectively disabling the first current source means in response to a power control signal.

4,516,083
FAST LOCK PLL HAVING OUT OF LOCK DETECTOR CONTROL OF LOOP FILTER AND DIVIDER

William J. Turney, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 14, 1982, Ser. No. 378,458
Int. Cl.³ H03L 7/10, 7/18
U.S. Cl. 331—1 A 14 Claims



1. A method of increasing speed of recovery of phase lock in a phase locked loop of a frequency synthesizer having an output signal comprising the steps of:

sensing the difference in phase between a reference signal and another signal derived from said output signal;

detecting if said difference is within a predetermined range, is less than said range, or is greater than said range; said phase locked loop not being in lock when said difference is either less than or greater than said range;

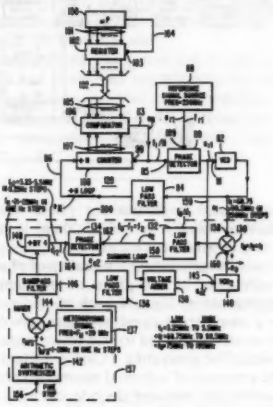
changing a divisor of a frequency divider in the phase locked loop to a first number if said difference is less than said range; and

changing said divisor to a second number different than said first number if said difference is greater than said range, said first and second numbers selected to cause said difference to rapidly come within said range thereby increasing the speed of recovery of phase lock.

4,516,084
FREQUENCY SYNTHESIZER USING AN ARITHMETIC FREQUENCY SYNTHESIZER AND PLURAL PHASE LOCKED LOOPS

Albert T. Crowley, Somerdale, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 18, 1983, Ser. No. 467,644
Int. Cl.³ H03L 7/00
U.S. Cl. 331—2 9 Claims



1. A frequency synthesizer comprising:

a phase locked loop comprising a first voltage controlled oscillator (VCO) for generating a signal e_1 of frequency f_1 and having a frequency control input, a divide-by-N divider to divide f_1 by N to produce a signal e_N of frequency f_1/N, a first phase detector responsive to e_N and to a reference signal e_{r1} of frequency f_{r1} to produce a control signal e_{c1}, and means coupling e_{c1} to the frequency control input of said first VCO;

a means for changing the value of N in said divider;

a summing phase locked loop comprising a second VCO for generating a signal e_0 of frequency f_0, and having a frequency control input, a subtractor for subtracting f_1 from f_0 to produce a signal e_2 of frequency $f_2=f_0-f_1$, logic means including a second phase detector responsive to e_2 and a second reference signal e_{r2} to produce a second frequency control signal e_{c2}, and filter means responsive to e_{c2} for supplying a filtered e_{c2}' to the frequency control input of said second VCO; and

means for generating said second reference signal e_{r2} comprising:

an accumulator containing digital data corresponding to the instantaneous phase of a waveform, said data contents being augmented by a selectable increment in response to each pulse of a clocking signal applied to said accumulator, said accumulator having overflow capability when said data contents are augmented beyond the capacity of said accumulator;

means responsive to said data contents of said accumulator for providing a signal of frequency f_{AFS}, said signal having said waveform and having period equal to the time between successive overflow occurrences of said accumulator;

source means for providing a heterodyning signal of predetermined frequency;

means responsive to said signal of frequency f_{AFS} and to said heterodyning signal for generating a heterodyned signal

having frequency f_H which is the sum of f_{AFS} and the frequency of said heterodyning signal; and

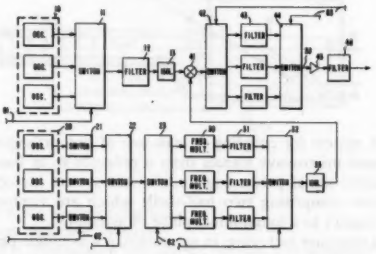
means coupled to said heterodyned signal for dividing the frequency f_H of said heterodyned signal by an integer M to produce said second reference signal e_{r2} of frequency f_{r2}.

4,516,085

MICROWAVE FREQUENCY SYNTHESIZER USING PLURAL SWITCHABLE LOW NOISE OSCILLATORS

David D. Effinger, La Habra, and Richard Docter, Chino, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 2, 1982, Ser. No. 404,161
Int. Cl.³ H03B 21/01
U.S. Cl. 331—40 **17 Claims**



1. A microwave frequency synthesizer responsive to electrical control signals for providing a selected one of a plurality of low phase noise, synthesized microwave signals, comprising:

a free running, incoherent microwave frequency oscillator which produces a low phase noise signal of a substantially fixed frequency in the microwave frequency range;

a plurality of crystal controlled oscillators for providing low phase noise output signals having frequencies such that eight times the value of any one of the frequencies is in a lower frequency band than the frequency of the microwave oscillator signal;

first switch means responsive to the electrical control signals for electrically selecting one of the plurality of the signals provided by the plurality of crystal controlled oscillators while isolating the remainder;

a frequency multiplier for producing a signal whose frequency is a multiple of the frequency of the selected crystal controlled oscillator signal by receiving the selected crystal controlled oscillator signal and multiplying the frequency thereof by a factor no greater than eight and no less than two; and

a mixer for processing the signal produced by the microwave frequency oscillator with the frequency multiplied signal and producing a synthesized signal having a frequency equal to the sum of the frequencies of the two processed signals.

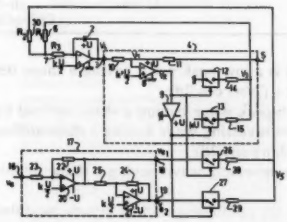
4,516,086

FREQUENCY MODULATOR FOR THE TRANSMISSION OF ANALOG DATA

Robert Boudault, Limours, France, assignor to 501 Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed Jul. 6, 1983, Ser. No. 511,379
Claims priority, application France, Jul. 7, 1982, 82 11925
Int. Cl.³ H03B 5/20; H03C 3/02; H04L 27/12
U.S. Cl. 332—16 R **4 Claims**

1. A modulator for transmitting an analog data signal by variation of the frequency of an oscillator comprising a first operational amplifier combined with a capacitor to form an integrator whose output is connected to the input of a bistable circuit with trigger hysteresis, the output of the bistable circuit supplying a two-level voltage which is applied to one terminal of a first resistor whose other terminal is connected to the input of said integrator so as to produce at its output a triangular wave voltage whose frequency depends on the current flowing through said first resistor, said bistable circuit being formed by a second operational amplifier followed by an inverter, one input of this operational amplifier being connected to the intermediate terminal of a resistor bridge connected between the outputs of said integrator and said bistable circuit, characterized in that said two-level voltage at the output of said bistable circuit is formed from zero ground potential and a fixed positive potential lower than the supply voltage U, applied respectively to the inputs of a first and a second analog switch whose common outputs are connected to the output of said bistable



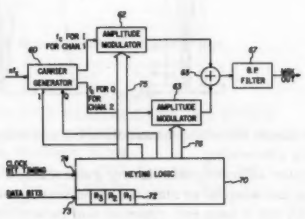
circuit, the input and output signals of said inverter being used respectively to control said first and second switches, said data signal being applied to the input of an analog data conversion circuit arranged so as to supply at its outputs a first and a second voltage which are variable as a function of the data signal and symmetrical with respect to the mean value of the third potentials at the inputs of said first and second switches, said first and second variable voltages being respectively applied to the inputs of a third and a fourth analog switch having their common outputs connected to one terminal of a second resistor whose other terminal is common with that of said first resistor, the input and output signals of said inverter being used respectively to control said third and fourth switches.

4,516,087

METHOD FOR REDUCING SIDE-LOBE ENERGY IN AN MSK DETECTABLE SIGNAL

Warren B. Bruene, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 12, 1982, Ser. No. 367,705
Int. Cl.³ H03C 3/00
U.S. Cl. 332—17 **3 Claims**



1. Means for generating an MSK detectable signal for transmission of a binary data signal having a sequence of mark and space data bits comprising:

a waveform generator for phase controlling a pair of orthogonally oriented waves in accordance with respective successive alternate data bits of said data signal and for amplitude modulating each of said orthogonally oriented waves with a waveform pair so that said modulated or-

thogonally oriented waves have continuously rounded phase transitions;

said waveform pair being selected in accordance with the states of three successive bits of said data signal according to the following table:

next bit	present bit	previous bit	waveform pair
0	0	0	lp–slr
0	0	1	slr–hp
0	1	0	lp–slr
0	1	1	slr–hp
1	0	0	slr–hp
1	0	1	lp–slr
1	1	0	slr–hp
1	1	1	lp–slr

wherein lp is a low-peak wave having a shape defined by 2 sin 45 $(1-(2/\pi)\cos 2\theta)$;

hp is a high-peak wave having a shape defined by 2 sin θ;

slr is a slope reversing wave having a shape defined by 2 sin 45 $(1-(2/\pi)\cos 2\theta)$;

slr is a sign reversing wave having a shape defined by 2 sin θ;

and means for combining said amplitude modulated signals into a combined signal to form said MSK detectable signal.

4,516,088

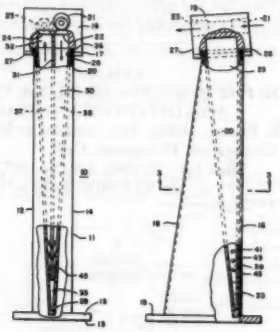
POWER ABSORBING TERMINATION FOR A WAVEGUIDE TRANSMISSION LINE

Ray M. Johnson, 6355 Scarlett Ct., Dublin, Calif. 94566, and George H. Dremann, 1940 Hopkins, Berkeley, Calif. 94707

Filed Nov. 30, 1981, Ser. No. 325,675

Int. Cl.³ H01P *1/26*

U.S. Cl. 333—22 F **17 Claims**



1. A power absorbing termination for a waveguide transmission line comprising

a section of waveguide having guidewalls, a power receiving end adapted to mate with said waveguide transmission line, and a base end opposite said power receiving end,

a dielectric taper, defined by a base and point end, extending through said waveguide section from the base end thereof and being inclined relative to the axis of said waveguide such that the point end of said dielectric taper lies substantially against the guidewall of said waveguide section,

said dielectric taper having fluid circulating passage means therein for circulating fluids through said taper from the base end to the point end thereof,

said waveguide section tapering from its power receiving end to its base end such that the cross-sectional area of the base end of the waveguide section decreases with the increased cross-sectional area of said dielectric taper, and

fluid inlet and fluid outlet means communicating with the fluid passage means of said taper.

4,516,089

SYSTEM FOR RECEIVING MICROWAVE SIGNALS HAVING ORTHOGONAL POLARIZATIONS

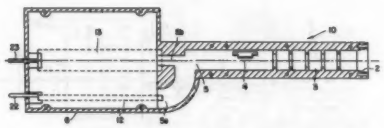
Michel Goscianski, Amfreville sur Iton, and Francois de Ronde, Lesigny, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1982, Ser. No. 358,754

Claims priority, application France, Mar. 18, 1981, 81 05406

Int. Cl.³ H01P *1/161*

U.S. Cl. 333—135 **5 Claims**



1. A system for coupling at least one of two orthogonally-polarized microwave signals from a reflector to at least one respective signal processing circuit, said system including a structure comprising two half-shells which are symmetrical with respect to a longitudinal plane of assembly,

said structure including, in succession, a waveguide portion, a mode separator and a housing containing at least one respective support plate for said at least one signal processing circuit,

said waveguide portion forming a horn and a bandpass filter, and said mode separator comprising means for coupling at least one of said signals from the waveguide portion to the at least one respective support plate in the housing.

4,516,090

ULTRASONIC DELAY LINE

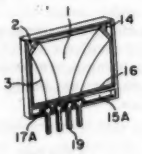
Toru Kambara; Michihiko Uemura, and Takeya Iwanaga, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,503

Claims priority, application Japan, Apr. 22, 1982, 57-57630[U]; Apr. 22, 1982, 57-57631[U]

Int. Cl.³ H03H *9/10, 9/25, 9/36*

U.S. Cl. 333—141 **6 Claims**



1. An ultrasonic delay line comprising: a casing having therein a delay medium accommodating section to accommodate therein a delay medium and a terminal accommodating section to accommodate therein planar metal terminals; and a cover to tightly close said casing, wherein said terminal accommodating section has a plurality of projections to fix the planar metal terminals, a partition frame is provided between said terminal accommodating section and said delay medium accommodating section to separate said both accommodating sections, the delay medium is accommodated in said delay medium accommodating section, the base part of said planar metal terminal is positioned and housed by means of projec-

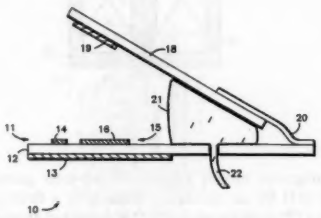
tions in said terminal accommodating section, and one end of a lead wire, the other end of which has been connected with a transducer provided on the side surface of the delay medium, is connected with the base part of said planar metal terminals.

4,516,091

LOW RCS RF SWITCH AND PHASE SHIFTER USING SUCH A SWITCH

Bill H. Sasser, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1983, Ser. No. 563,329
Int. Cl.³ H01P *1/18, 1/10, 1/12*
U.S. Cl. 333—161 **11 Claims**



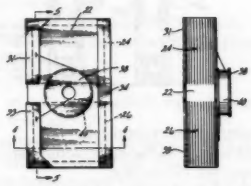
1. An RF switch conprising:
a first dielectric substrate;
an RF transmission line carried on said first substrate;
at least one device on said substrate to be one of coupled to and isolated from said RF transmission line;
a second dielectric substrate;
at least one bridge conductor carried on said second substrate, said at least one bridge conductor coupling said at least one device to said RF transmission line when said second substrate is in a first position and failing to so couple when said second substrate is in a second position, said second substrate being spring biased to one of said first and second positions and being pneumatically actuated to the other of said positions.

4,516,092

LEADLESS FILTER COMPONENT

Michael A. Rosenberg, Tarzana, Calif., assignor to SFE Technologies, San Fernando, Calif.

Filed Feb. 18, 1983, Ser. No. 467,605
Int. Cl.³ H03H *7/075, 7/01*
U.S. Cl. 333—184 **6 Claims**



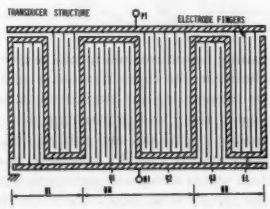
1. A π-filter comprising a monolithic ceramic capacitor chip including at least two groups of parallel conductive plates embedded in a ceramic chip, the plates of each group forming two sets, the plates of the first set being interleaved with the plates of the second set, the plates of the first set of both groups extending to a first face of the chip but not the other faces, the plates of the second set of both groups extending to a second face of the chip opposite the first face but not the other faces, a first conductive layer on the first face in electrical contact with the first set of plates of both the first and second groups, second and third conductive layers on second face of the chip in electrical contact respectively with the second set of plates of the first group and of the second group, and an inductor including a bobbin secured to a third face of the chip and a conductor wound on the bobbin, opposite ends of the conductor being electrically connected respectively to the second and third conductive layers.

4,516,093

SURFACE ACOUSTIC WAVE FILTER

Felix Nyffeler, Affoltern, Switzerland, assignor to Siemens-Albis AG, Zurich, Switzerland

Filed Jul. 29, 1983, Ser. No. 518,562
Claims priority, application Switzerland, Sep. 7, 1982, 5310/82
Int. Cl.³ H03H *9/145, 9/64*
U.S. Cl. 333—193 **7 Claims**



1. A surface acoustic wave (SAW) filter formed by a piezoelectric substrate having a substrate surface and at least one transducer disposed on said surface; said transducer comprising, in combination a first plurality of spaced, generally parallel, electrically conductive finger electrodes which are connected to a first terminal and carried by said substrate, and a second plurality of spaced, generally parallel, electrically conductive finger electrodes which are connected to a second terminal and carried by said substrate; the finger electrodes of the first plurality being generally arranged in the intermediate spaces between the finger electrodes of the second plurality; a common terminal for each of said first and second plurality of finger electrodes, said common terminal comprising a strip of electrically conductive material spaced from and meandering through the spaces between said first and second plurality of finger electrodes; said first plurality having several finger electrodes arranged at distances from each other that have values B1, B2, B3, . . . , for which the following condition applies:

$$B1 \leqq B2 \leqq B3 \leqq \ldots .$$

where the equal sign is omitted at least once.

4,516,094

ACOUSTIC SURFACE WAVE DEVICE

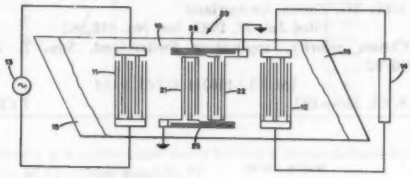
Ching W. Lee, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 23, 1983, Ser. No. 564,795
Int. Cl.³ H03H *9/64, 9/145*
U.S. Cl. 333—194 **8 Claims**

1. An acoustic surface wave device comprising
an acoustic surface wave propagating medium;
an input transducer for launching acoustic surface waves along a propagation path in said medium, the input transducer comprising two sets of interleaved electrodes disposed on the surface of the acoustic surface wave propagating medium with the electrodes extending transversely to the propagation path;
an output transducer across said propagation path for receiving and detecting acoustic surface waves propagated along the propagation path from the input transducer, the output

transducer comprising two sets of interleaved electrodes disposed on the surface of the acoustic surface wave propagating medium with the electrodes extending transversely to the propagation path;

a first attenuating transducer interposed across said propagation path between the input transducer and the output transducer for intercepting and attenuating acoustic surface waves propagated along said propagation path; and



a second attenuating transducer interposed across said propagation path between the input transducer and the output transducer for intercepting and attenuating acoustic surface waves propagated along said propagation path;

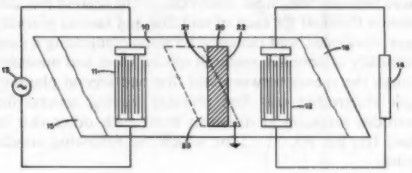
said first attenuating transducer and said second attenuating transducer being spaced apart by a distance so as to reflect acoustic surface waves along said propagation path 180° out of phase at the synchronous frequency of the device.

4,516,095

SURFACE ACOUSTIC WAVE DEVICE

Ching W. Lee, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 23, 1983, Ser. No. 564,796
Int. Cl.³ H03H *9/42, 9/64, 9/145*
U.S. Cl. 333—194 **7 Claims**



1. An acoustic surface wave device comprising:

an acoustic surface wave propagating medium;

an input transducer for launching acoustic surface waves along a propagation path in said medium, the input transducer comprising two sets of interleaved electrodes disposed on the surface of the acoustic surface wave propagating medium with the electrodes extending transversely to the propagation path;

an output transducer across said propagation path for receiving and detecting acoustic surface waves propagated along the propagation path from the input transducer, the output transducer comprising two sets of interleaved electrodes disposed on the surface of the acoustic surface wave propagating medium with electrodes extending transversely to the propagation path; and

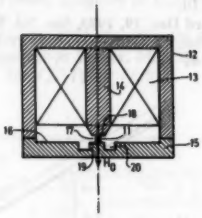
an acoustic energy absorber of acoustic surface wave absorbing material interposed across said propagation path between the input transducer and the output transducer and extending across the entire transducer aperture for intercepting and attenuating acoustic surface waves propagated along said propagation path.

4,516,096

MAGNETIC CIRCUIT FOR AN YTTRIUM-IRON GARNET CRYSTAL RESONATOR FOR AN OSCILLATOR

Daniel Doyen, Ozoir, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,146
Claims priority, application France, Nov. 22, 1982, 82 19525
Int. Cl.³ H01P *7/00*
U.S. Cl. 333—219 **2 Claims**



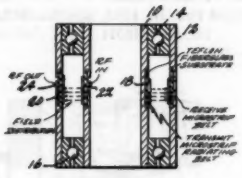
1. A magnetic circuit for an yttrium-iron garnet crystal resonator (**11**) for an oscillator, formed by a first cylindrical pole piece (**12**) comprising a coil (**13**) provided around an axial core (**14**) and a second cylindrical pole piece (**15**) having a flat bottom (**16**), the two cylindrical pole pieces (**12,15**) being joined together so as to close the magnetic circuit, and the yttrium-iron garnet crystal (**11**) being placed in a gap (**17**) defined by an end (**18**) of the axial core (**14**) and that part (**19**) of the flat bottom facing said end (**18**), characterized in that a circular groove (**20**) is arranged in the flat bottom (**16**) around the part (**19**) facing the end (**18**) of the axial core (**14**).

4,516,097

APPARATUS AND METHOD FOR COUPLING R.F. ENERGY THROUGH A MECHANICALLY ROTATABLE JOINT

Robert E. Munson, and Hussain A. Haddad, both of Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 3, 1982, Ser. No. 404,655
Int. Cl.³ H01P *1/06;* **H01Q** *1/38*
U.S. Cl. 333—261 **31 Claims**



1. An r.f. rotary joint comprising:

a first cylindrical r.f. radiating structure having its radiation pattern directed outwardly;

a first single r.f. feed point and feed structure fixedly connected to feed r.f. energy to/from said first cylindrical radiating structure of substantially uniform amplitude and phase around its cylindrical circumference;

a second cylindrical r.f. radiating structure disposed concentrically around the first structure and having its radiation pattern directed inwardly;

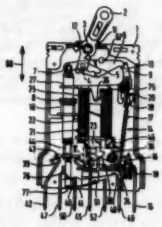
a second single r.f. feed point and feed structure fixedly connected to feed r.f. energy to/from said second cylindrical radiating structure of substantially uniform amplitude and phase about its cylindrical circumference; and

rotary bearing means mounting said first and second structures for relative rotation.

4,516,098
OVERCURRENT PROTECTION SWITCH

Fritz Krasser, Altdorf, and Josef Kinner, Burthann, both of Fed. Rep. of Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 478,983
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211246
Int. Cl.³ H01H 73/48
U.S. Cl. 335—35 17 Claims

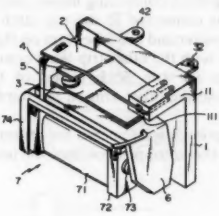


1. An overcurrent protection switch comprising:
a pair of switching contacts;
at least one trip element;
a mechanical switch latch composed of an actuating element (2) and a latching lever (6) which acts in conjunction with said actuating element and which has a first end and a second end;
a plunger (8) disposed to be acted upon by said first end and essentially guided, under an initial spring tension, at right angles to said latching level (6) for selectively connecting and disconnecting said pair of switching contacts;
a trip lever (9) movable between an untripped position and a tripped position and having a support area (13) on which said second end of said latching lever (6) rests, under the influence of the initial spring tension on said plunger (8), when said trip lever (9) is in its untripped position, said trip lever being disposed to be moved into its tripped position by said trip element; and
a housing containing said switching contacts, said trip element, said mechanical switch latch, said plunger and said trip lever;
wherein said trip lever:
is composed of two arms which extend from a common location to form an "L";
is provided, at the common location, with a pivot which is stationary with respect to said housing;
includes means biassing said trip lever toward its untripped position;
has one of its said arms extending essentially at right angles to said plunger; and
has the other of its arms extending essentially parallel to said plunger and toward said actuating element (2), with said support area (13) being disposed at the free end of said other arm; and further wherein:
said plunger (8) is provided with a longitudinal groove in which engages the free end of said one arm of said trip lever (9); and said longitudinal groove has an end constructed to act as a stop for said free end of said one arm of said trip lever (9).

4,516,099
ELECTROMAGNETIC RELAY

Kunihisa Fujii, Saku; Noboru Tomono, Usuda; Hajime Watanabe, Saku, and Yasushi Miyakoshi, Komoro, all of Japan, assignors to Takamisawa Electric Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,584
Claims priority, application Japan, Apr. 17, 1981, 56-54587[U]
Int. Cl.³ H01H 51/08
U.S. Cl. 335—135 6 Claims



1. An electromagnetic relay comprising a base block, an electromagnet, an armature, a card and a plurality of spring means, and means for fixing at least one of said spring means to said base block comprising:
a solid cubic protrusion formed on a predetermined portion of said base block, said protrusion having formed therein a slot for receiving said one of said spring means and a plurality of deep holes adjoining said slot and extending into said cubic protrusion therefrom, at least one cubic column being formed between said deep holes;
a plurality of side projections formed on a portion of said one of said spring means, said side projections being positioned to fit into said deep holes when said one of said spring means is inserted into said slot with the side edge portion of said one of said spring means abutting against the top of said cubic column;
whereby the end portion of said one of said spring means including said side projections is firmly fixed to said cubic protrusion.

4,516,100
MECHANICAL INTERLOCK FOR VERTICALLY MOUNTED CIRCUIT BREAKERS

James B. Wallace, Sarasota, Fla., and Glenn R. Thomas, Brighton, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1983, Ser. No. 562,502
Int. Cl.³ H01H 33/46
U.S. Cl. 335—160 7 Claims

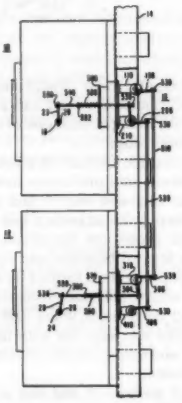
1. An interlock mechanism for preventing a pair of vertically mounted circuit breakers from being concurrently closed, each circuit breaker including a trip latch means operable between tripped and untripped positions that when tripped opens the circuit breaker when closed and prevents closing thereof and when untripped allows the circuit breaker when open to be closed, and a contact position indicator means for providing mechanical indication of the open position and the closed position of the circuit breaker, comprising:
a first bell crank assembly;
a second bell crank assembly;
a third bell crank assembly;
a fourth bell crank assembly, the first and second bell crank assemblies mounted adjacent the first circuit breaker with the third and fourth bell crank assemblies mounted adjacent to the second circuit breaker, the first and third bell crank assemblies being substantially parallel to one another and having one arm of each being in corresponding radial and vertical alignment with the other arm of the first bell crank assembly connected to the contact position

indicator means of the first circuit breaker, the arrangement of the fourth bell crank assembly on the second circuit breaker and that of the second bell crank assembly being substantially similar to that of the first and third bell crank assemblies, respectively;

a pair of bell crank assembly intraconnecting means, one bell crank assembly intraconnecting means connecting correspondingly aligned arms of the first and third bell crank assemblies and the second and fourth bell crank assemblies, respectively;

a pair of trip latch connecting means, one trip latch connecting means connected to the trip latch means of the first circuit breaker and the other arm on the second bell crank assembly with the other trip latch connecting means connected to the trip latch means of the second circuit breaker and the other arm on the third bell crank assembly; and

trip latch spring biasing means for returning each trip latch means to the untripped position, the interlock for the first



circuit breaker being actuated by the contact position indicating means thereof moving to the closed position causing the rotation of the first bell crank assembly via the arm thereof connected to the contact position indicating means, the rotation of the first bell crank assembly moving the bell crank assembly intraconnecting means connected thereto that in turn rotates the third bell crank assembly connected thereto moving the trip latch connecting means that moves the trip latch means of the second circuit breaker to the tripped position preventing the second circuit breaker from closing and upon opening of the first circuit breaker the trip latch spring biasing means moving the trip latch means of the second circuit breaker back to the untripped position allowing the second circuit breaker to be closed, the interlock for the second circuit breaker functioning in substantially the same manner with the first circuit breaker via the fourth and second bell crank assemblies thereby allowing only one of the two circuit breakers to be closed at any time.

4,516,101

AIR-FLOW-RATE SENSORS

Michio Nemoto; Kiyokazu Yoshida, and Tetsuro Baba, all of Sendai, Japan, assignors to Tohoku Metal Industries, Ltd., Miyagi, Japan

Filed Feb. 22, 1984, Ser. No. 582,530

Claims priority, application Japan, May 2, 1983, 58-66760[U]; May 14, 1983, 58-83485; May 14, 1983, 58-71138[U]

Int. Cl.³ H01H *37/58*

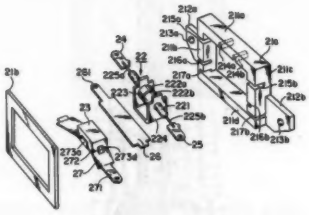
U.S. Cl. 335—208 **18 Claims**

1. An air-flow rate sensor for detecting whether the current air flow is less than a predetermined rate or not, which comprises:

an insulator frame having an opening chamber;

a thermo-magnetically operated switch comprising an assembly of a reed switch unit, at least one permanent magnet and at least one temperature sensitive ferromagnetic piece, said thermo-magnetically operated switch being mounted on said insulator frame to be fixedly disposed within said opening chamber;

first terminal plate means being in contact with said at least one temperature sensitive ferromagnetic piece of said



thermo-magnetically switch and being fixedly mounted on said insulator frame to extend within said opening chamber;

second terminal plate means being spaced from said first terminal plate means and being fixedly mounted on said insulator frame to extend within said opening chamber; and

positive temperature characteristic thermister means having two electrodes on its opposite side surfaces and fixedly held by said first and second terminal plate means, said two electrodes being in contact with said first and second terminal plate means, respectively.

4,516,102

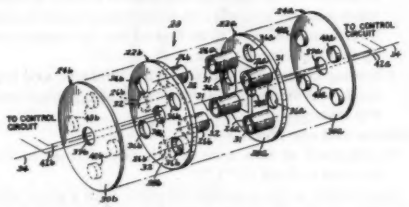
ELECTRICALLY-POWERED EXPANSION/CONTRACTION APPARATUS

Mark C. Rask, 4205 - 46th Ave. North, Minneapolis, Minn. 55422

Filed Nov. 2, 1983, Ser. No. 548,214

Int. Cl.³ H01F *7/08*

U.S. Cl. 335—267 **14 Claims**



1. An electrically controlled expansion and contraction device comprising a plurality of motor units, each of said plurality of motor units comprising:

(a) first electrically powered means for emanating a first force field;

(b) second electrically powered means for emanating a second force field;

(c) a first motor element movable with respect to said first force field emanating means and in response to said first force field emanated therefrom, said first force field emanating means and said first motor element comprising a first motor subunit, a first variable distance being between said first force field emanating means and said first motor

element, an increase of said first variable distance being an expansion of said first motor subunit and a decrease of said first variable distance being a contraction of said first motor subunit;

(d) a second motor element movable with respect to said second force field emanating means and in response to said second force field emanated therefrom, said second force field emanating means and said second motor element comprising a second motor subunit, a second variable distance being between said second force field emanating means and said second motor element, an increase of said second variable distance being an expansion of said second motor subunit and a decrease of said second variable distance being a contraction of said second motor subunit;

(e) first stop means mechanically connecting said first force field emanating means to said first motor element for preventing said first variable distance from being greater than a first upper limit and preventing said first variable distance from being less than a first lower limit while substantially freely permitting said first variable distance to vary between said first upper limit and said first lower limit;

(f) second stop means mechanically connecting said second force field emanating means to said second motor element for preventing said second variable distance from being greater than a second upper limit and preventing said second variable distance from being less than a second lower limit while substantially freely permitting said second variable distance to vary between said second upper limit and said second lower limit;

(g) motor subunit interconnecting means for mechanically connecting said first motor subunit to said second motor subunit; and

(h) motor unit interconnecting means for mechanically connecting said each motor unit to another one of said plurality of motor units, whereby the cumulative expansions and contractions of said first and second motor subunits provide expansion and contraction of said motor units and the cumulative expansions and contractions of said motor units provide expansion and contraction of said expansion and contraction device.

4,516,103

PLUG-IN ARRANGEMENT AND PROCESS FOR TIN PLATING CONTACTS OF A PLUG-IN ARRANGEMENT

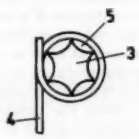
Ernst Arnold, Buchs, Switzerland, assignor to Meteor AG, Ruschlikon, Switzerland

Filed Aug. 23, 1983, Ser. No. 525,645

Claims priority, application Switzerland, May 17, 1983, 2674/83

Int. Cl.³ H01F *15/02, 15/10*

U.S. Cl. 336—65 **15 Claims**



1. A plug-in arrangement for printed circuits, comprising electric coil windings surrounding a coil form having contact pins, the coil form and the contact pins being nonmetallic, end portions of the windings surrounding the contact pins, the contact pins being profiled and having continuous channels extending in the longitudinal direction along an axis of the contact pins, said channels creating spaces between said pins and said surrounding end portions which extend generally transverse to said channels, and solder beneath said end portions in said spaces.

4,516,104

COIL ASSEMBLY FOR HOT MELT INDUCTION HEATER APPARATUS

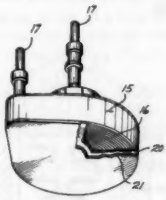
Arthur W. McDermott, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 260,970, May 6, 1981, Pat. No. 4,420,876.

This application Oct. 29, 1982, Ser. No. 437,774

Int. Cl.³ H01F *27/30*

U.S. Cl. 336—206 **2 Claims**



1. A coil assembly for use in induction heating apparatus comprising a plurality of windings of a flat shaped electrical conductor, said electrical conductor wrapped with a polyimide tape, said polyimide tape having two major side surfaces, each of said side surfaces having a coating of fluoroplastic material, and, including a fluoroplastic face sheet (**21**) supported by a major surface of said coil assembly and providing a non-stick surface for release of hot melt adhesive material and further including a fluoroplastic coated polyimide sheet (**20**) fused to and disposed between said face sheet (**21**) and said major surface of said coil.

4,516,105

METAL OXIDE VARISTOR WITH NON-DIFFUSABLE ELECTRODES

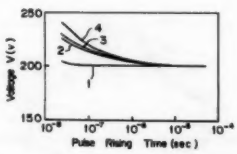
Motomasa Imai; Takashi Takahashi, both of Tokyo; Osamu Furukawa, Sagamihara, and Hideyuki Kanai, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 6, 1982, Ser. No. 395,278

Claims priority, application Japan, Jul. 16, 1981, 56-110028

Int. Cl.³ H01C *7/10;* **C04B** *35/00*

U.S. Cl. 338—21 **10 Claims**



1. A metal oxide varistor which comprises (1) a sintered body containing (a) ZnO as a principal component, (b) Bi, Co and Mn each in amounts of about 0.05 to about 2 mole %, when calculated in terms of Bi_2O_3, Co_2O_3 and MnO_2, respectively, and (c) at least one selected from Al, In and Ga in amounts of about 1×10^{-4} to about 3×10^{-2} mole %, when calculated in terms of Al_2O_3, In_2O_3 and Ga_2O_3, respectively, said sintered body having been reheated at a temperature of about 700° to about 900° C. after sintering; and (2) a non-diffusible electrode provided on said sintered body after reheating of said sintered body.

4,516,106

TEMPERATURE SENSING MODULE

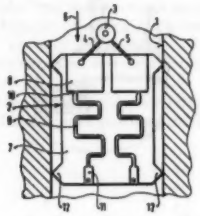
Peter Nolting, Buhlertal, Fed. Rep. of Germany, and Claude Bleger, Duttlenheim, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 399,985, Jul. 19, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 586,651

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134166

Int. Cl.³ H01C *3/04*

U.S. Cl. 338—28 **13 Claims**



1. A gas temperature-sensing module for use in an air duct of a heating or air-conditioning system of a motor vehicle, including an electrical temperature-sensitive element provided with connection wires which simultaneously act as a support for the sensitive element, comprising a carrier body of an electrically insulating material having poor thermal conductivity; a pair of conductive webs arranged on said carrier body and each defining an enlarged end portion connected to an assigned connection wire, and a relatively narrow connection part having a meander-like configuration and being formed at its free end with a terminal contact area electrically connectable to said system; and supporting means attached to a minor part of said carrier body and being engageable with said air duct whereby said sensitive element together with major parts of said carrier body and said conductive webs are directly exposable to a gas stream in said air duct while only the minor part of said carrier body and the terminal contact area of said meander-like connection parts are in a direct mechanical contact with said duct and the rest of said system.

4,516,107

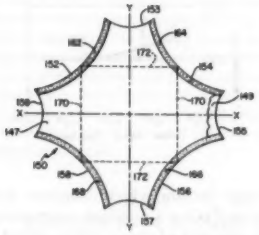
FUNCTION GENERATORS

Stephen D. Tritter, Fernwood La., Amherst, N.H. 03031

Filed Jan. 3, 1983, Ser. No. 455,238

Int. Cl.³ H01B *0/00*; **G01B** *7/00*

U.S. Cl. 338—89 **9 Claims**



1. A potentiometer-type function generator comprising:

a resistance element formed of a sheet material comprising four short circuit and four open circuit boundaries with each open circuit boundary being terminated at each end by a short circuit boundary, said resistance element having a first non planar surface and a uniform known resistivity, and said open circuit and short circuit boundaries being arranged so that when said resistance element is electrified a non-uniform voltage distribution is provided along said first surface;

means for connecting some of said short circuit boundaries to a source of positive electrical potential and means for connecting others of said short circuit boundaries to a source of negative potential, so as to electrify said resistance element;

a contact member in contact with said first surface; and

means for mounting said contact member and resistance element for relative movement in two directions.

4,516,108

ELECTRICAL RESISTOR OF STRETCHED SHEET METAL

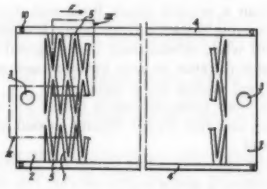
M. Maurice Buguet, Meudon la Foret, and M. Patrick Deruelle, Montbard, both of France, assignors to Le Metal Deploye, Clamart, France

Filed Nov. 22, 1982, Ser. No. 443,750

Claims priority, application France, Nov. 23, 1981, 81 21877

Int. Cl.³ H01C *10/14*

U.S. Cl. 338—319 **10 Claims**



1. An electrical resistor having sides and ends and comprising, a metal sheet cut to form a generally planar pattern of integrally connected conductors extending between said ends and to edges of said sides, said conductors defining a plurality of current paths between said ends, said conductors being integrally joined in at least one node spaced from the sides and ends and comprising a junction of at least two conductors, and an electrically insulated U-shaped stiffener mounted on each side edge of said resistor, each stiffener being continuous and extending around the conductors at a side edge, said U-shaped stiffeners being fastened only to portions of said side edges at spaced apart locations and at least at locations adjacent the ends of the resistor, so that there are unfastened portions of the side edges between the fastening locations, and wherein said U-shaped stiffeners confine the unfastened portions of the edges between the fastening locations to prevent curving of the edges.

4,516,109

ROAD BARRICADE FLASHER LIGHT COMBINATION

Kurt W. Thurston, Reno, Nev.

Filed Feb. 1, 1983, Ser. No. 462,980

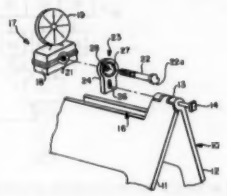
Int. Cl.³ E01F *9/01*

U.S. Cl. 340—114 B **9 Claims**

1. A road barricade flasher light combination where the barricade is in the form of a pair of legs each leg having a top bar and hinged together at the top by at least one hinge pin and

having an adjacent saddle formed by a pair of the top bars of the barricade, the flasher light having a body portion containing a battery and a light source extending from the top of the body portion, the body portion having a socket for receiving a threaded bolt, the improvement comprising:

bracket means having an elongated lever with first and second aperture means at the two ends of the lever, said first aperture means being slotted and receiving said hinge pin which is freely slidable in said slot; fastening means for permanently attaching said bracket means to said barri-



cade via said hinge pin; said second aperture means including a cup-shaped recess having an aperture through which said threaded bolt extends and is screwed into said socket in said body portion, the head of such bolt being recessed in said cup-shaped recess to prevent tampering; said body portion being rotatable on the axis of said threaded bolt, said first and second aperture means being spaced the approximate distance between the respective axes of said hinge pin and said socket in said body portion when the bottom of said body portion is resting on said saddle.

4,516,110

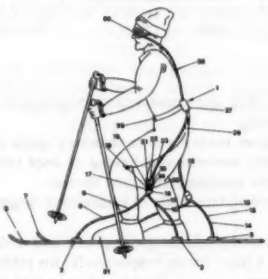
SKI STRESS SIGNALING DEVICE

Mark Overmyer, 3202 Prairie Rd., Rockford, Ill. 61102

Filed Aug. 9, 1982, Ser. No. 406,136

Int. Cl.³ G08B *23/00, 21/00;* **A63B** *69/18*

U.S. Cl. 340—323 R **3 Claims**



1. A ski stress signaling device comprising a plurality of strain gauges mounted on the top surfaces of a pair of skis and adapted to measure lengthwise strains in the said top surfaces of the said pair of skis; a plurality of electrical conductor wires adapted to connect the said plurality of strain gauges to form a Wheatstone bridge circuit; resistance compensation means adapted to compensate for any differences in the magnitudes of zero-stress resistances of the strain gauges of the said plurality of strain gauges; electrical conductor means adapted for connecting a direct current power supply to the said Wheatstone bridge circuit; first and second bridge output means;

a first amplifier means adapted to be connected to a direct current power source and adapted to amplify an output voltage of the said Wheatstone bridge circuit;

a second amplifier means adapted to be connected to a direct current power source and adapted to amplify an output voltage of the said Wheatstone bridge circuit;

a third amplifier means adapted to invert an output voltage of the said second amplifier means;

a first light emitting diode driver circuit adapted to be driven by an output voltage of the said first amplifier means and having a plurality of output means and adapted to be connected to a direct current power source wherein each of the said output means of the said plurality of output means is connected by electrical conductor means to an anode of a light emitting diode of a first plurality of light emitting diodes each having a cathode that is connected by electrical conductor means to a direct current power source;

a second light emitting diode driver circuit adapted to be driven by an output voltage of the said third amplifier means and having a plurality of output means and adapted to be connected to a direct current power and wherein each of the output means of the said plurality of output means is connected by electrical conductor means to an anode of a light emitting diode of a second plurality of light emitting diodes each having a cathode that is connected by electrical conductor means to a direct current power source;

a plurality of direct current power sources adapted to operate the aforesaid Wheatstone bridge circuit, the said first, second and third amplifier means, the said first and second light emitting diode driver circuits, and the said first and second pluralities of light emitting diodes; and a pair of goggles having mounted on a first portion of the perimeter thereof the said first plurality of light emitting diodes and having mounted on a second portion of the perimeter thereof the said second plurality of light emitting diodes.

4,516,111

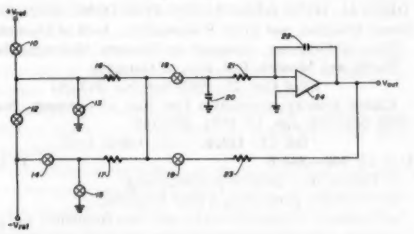
PULSEWIDTH MODULATED, CHARGE TRANSFER, DIGITAL TO ANALOG CONVERTER

William R. Slump, Glen Rock, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1982, Ser. No. 394,233

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **3 Claims**



1. A pulsewidth modulated, charge transfer, digital to analog converter for use in sample data systems comprising in combination:

an operational amplifier operating in the summing (filter) mode,

a first capacitor connected between the input and output of said operational amplifier,

a second capacitor adapted to be connected to a data source during sample periods and being disconnected therefrom during hold periods,

circuit means for transferring the charge on said second capacitor to said first capacitor during said hold periods, and

a feedback circuit connecting the output of said operational amplifier to said second capacitor during sample periods

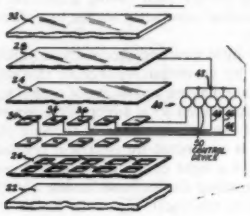
and disconnecting the output of said operational amplifier from said second capacitor during hold periods.

4,516,112

TRANSPARENT TOUCH SWITCHING SYSTEM

Chee G. Chen, Brown Deer, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 22, 1982, Ser. No. 351,081
Int. Cl.³ G08C *9/00*
U.S. Cl. 340—365 R **3 Claims**



1. A transparent touch switching system comprising a display screen, a transparent flexible piezoelectric polymer film supported above said screen for selective localized bending depression by a user's finger or the like towards said screen, said film having transparent flexible conductive coatings on opposite sides thereof for voltage generation in response to bending depression of said film, wherein said transparent flexible conductive coating on one side of said film is a continuous sheet, and said transparent flexible conductive coating on the other side of said film comprises a plurality of separate discrete sheet segments at selected separate areas, and comprising spacer means formed by a nonconductive transparent sheet supporting said piezoelectric polymer film above said screen and having a plurality of apertures through said sheet forming a waffle-like grid or matrix with each aperture aligned beneath a designated said discrete sheet segment, and including circuit connection means connected to said coatings for using said voltage as a trigger signal to drive designated circuitry.

4,516,113

DIGITAL TONE GENERATOR FOR TONE SEQUENCES

Bruno Scheckel, and Ernst Wittenzellner, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,253
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3043505; Jun. 15, 1981, 3050148
Int. Cl.³ H03K *5/156;* G08B *3/00*
U.S. Cl. 340—384 E **17 Claims**

1. Digital tone generator comprising:

an oscillator generating a base frequency,

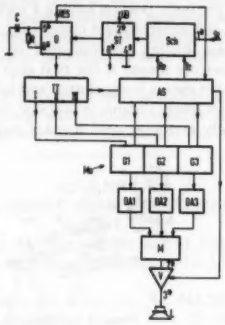
a frequency divider driven by said base frequency and generating a plurality of tone frequencies, said tone frequencies being sub-multiples of said base frequency,

a starting circuit operatively responsive to a start switch, said starting circuit operating to activate said oscillator and to activate a stable voltage supply,

a modulator comprising a plurality of modulator modules, said plurality equal to and corresponding to said plurality of tone frequencies, a general cycle control operatively responsive to said frequency divider to generate tone modulation control cycles,

a plurality of DA-converters, said plurality equal to and corresponding to said plurality of modulator modules, said frequency divider and said general cycle control jointly controlling said modulator to produce a plurality of modulated tone frequencies, said plurality equal to and corresponding to said plurality of modulator modules,

said plurality of DA-converters operatively responsive to said modulated tone frequencies to produce modulated analog tone frequencies, and a mixer for receiving said



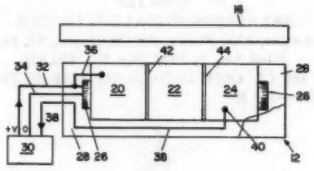
modulated analog tone frequencies to produce a sequence of modulated analog tones.

4,516,114

MAGNETIC LOCKING STATUS DETECTION SYSTEM

Robert C. Cook, Redondo Beach, Calif., assignor to Securitron-Magnalock Corp., Torrance, Calif.

Filed Mar. 7, 1983, Ser. No. 473,010
Int. Cl.³ G08B *13/08*
U.S. Cl. 340—542 **10 Claims**



1. A magnetic lock and status detection system for a door or the like comprising:

an electromagnet having a core structure made of conductive magnetic material and having at least two separate core portions insulated from one another;

a magnetic strike plate made of conductive magnetic material;

means for mounting said electromagnetic and strike plate on a door and a door frame, respectively, for relative movement between a closed position wherein said strike plate engages both of said two separate core portions, and an open position wherein the door is open and said strike plate is spaced from said electromagnet;

an electrical control and sensing unit, said electrical control and sensing unit including door closure detection circuit means;

means for supplying power to said electromagnet from said electrical control and sensing unit; and

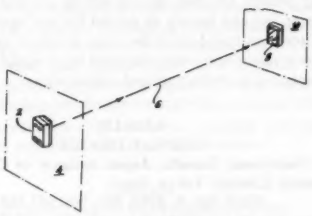
electrical connections from said detection circuit means of said control and sensing unit to each of said two separate core portions;

whereby the engagement of said strike plate with said two separate core sections and the resultant closure of an electrical path between said electrical connections indicates to said detection circuit means whether the door is open or closed.

4,516,115
INTRUSION DETECTION SYSTEM

Raymond A. Frigon, Watertown, and William G. Kahl, Jr., Brookfield, both of Conn., assignors to Cerberus AG, Switzerland

Filed Apr. 16, 1982, Ser. No. 369,227
Int. Cl.³ G08B *13/18*
U.S. Cl. 340—556 **19 Claims**



1. In an intrusion detector system of the type including a transmitter for transmitting a beam of electromagnetic energy, and a receiver including means for detecting said transmitted energy and means, including a first threshold detector, responsive to said detected energy for generating an alarm signal when the level of said detected energy does not exceed a first threshold value,

the improvement comprising:

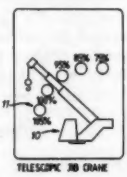
a light source mounted in said receiver and coupled to said alarm signal generating means such that said source is continuously lighted when said generating means generates an alarm signal, and

flasher circuitry mounted within said receiver and interposed between said means for detecting and said light source and including a second threshold detector responsive to said detected energy for flashing said source when said detected energy does not exceed a second threshold value at least four times greater than said first threshold value.

4,516,116
APPARATUS FOR VISUALLY DISPLAYING THE LOAD-MOMENT, AXLE-LOAD, OR PAYLOAD OF A VEHICLE

Iain S. White, Leamington Spa, England, assignor to Safety Devices (Engineering) Limited, Suffolk, England

Filed Dec. 16, 1981, Ser. No. 331,154
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—685 **6 Claims**

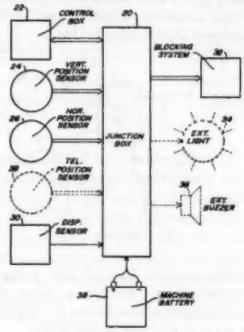


1. A visual display unit for displaying variations in the quotient of applied load to safe working load for a mechanical handling vehicle, the visual display unit comprising display means, a representation of said vehicle on the display means, means for giving a primary visual indication of the quotient of applied load to safe load and including visual transducer means for providing different visual indications on the display means, and means for locating said visual transducer means in a predetermined position on said display relative to said representation of said vehicle to give a secondary visual indication depicting increasing and decreasing radius of applied load by the relative locations of successive visual indications on said display.

4,516,117
RANGE CONTROLLER FOR CONTINUOUSLY MONITORING THE POSITION OF THE BOOM OF HEAVY MACHINERY

Raymond Couture, 222 Pente du Moulin, Beauceville, County of Beauce, Canada G0S 1A0; Raynald Couture, Lac Etchemin, County of Bellechasse, Canada G0R 1S0, and Paul Poulin, 816 Principale St., St. Elzéar, County of Beauce, Quebec, Canada (G1V 4K1)

Filed Apr. 5, 1982, Ser. No. 365,488
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—685 **8 Claims**



1. A range controller for continuously monitoring the position of the boom of heavy machinery, comprising:

(a) position sensors mounted on the boom and on the machinery for continuously detecting the position of the boom with respect to a reference;

(b) control switches located in the cabin of the machinery for permitting the operator to set the position limits of the boom;

(c) a central control circuit mounted on the machinery and comprising a micro-processor circuit adapted for connection to the sensors and to the control switches and two memory devices connected to said micro-processor circuit for registering the position of the boom as well as the position limits set by the operator and for continuously comparing the actual position of the boom with the position limits;

(d) indicators located in the cabin of the machinery and responsive to said micro-processor circuit for warning the operator when a position limit is reached;

(e) a blocking system responsive to the micro-processor for blocking the operation of the boom when a position limit is reached;

(f) a main relay for operating said blocking system, said main relay being electrically energized during normal operation of the machine to release the blocking system so that, if there is a power failure, or a break in a wire, etc., the main relay is released to operate the blocking system; and

(g) additional relays for reversing the operation of the boom when the main relay is released so as to ensure safe stopping of the boom.

4,516,118
PULSE WIDTH MODULATION CONVERSION CIRCUIT FOR CONTROLLING A COLOR DISPLAY MONITOR

Clayton C. Wahlquist, West Valley City, Utah, assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 30, 1982, Ser. No. 412,689
Int. Cl.³ G09G *1/28*
U.S. Cl. 340—703 **11 Claims**

1. A conversion circuit for a video display terminal having twenty-seven selectable colors comprising:

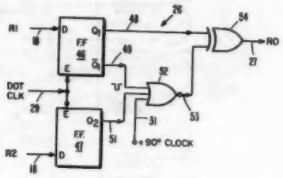
an eight-color CDM of the type having only three RGB video input lines,

a cathode ray tube controller of the type having six output color control signal lines capable of defining sixty-four logic states, each signal line having two logic states being defined by full width pulses or the absence of full width pulses,

said six output color control signal lines providing three RGB color pairs of output color control lines,

three pulse width modulation conversion circuits each having one of said three RGB color pairs of output control lines coupled to its input,

each said pulse width modulation conversion circuit having its output coupled to one of said three RGB video input lines of said eight-color CDM,



each output control line of said pulse width modulation conversion circuit having at least three possible pulse width modulation conditions in response to the two logic states on said control signal lines,

said logic states being full width pulses and the absence of full width pulses and said pulse width modulation conditions being partial width pulses, full width pulses and the absence of pulses, and

a dot clock generator coupled to said three pulse width modulation conversion circuits and to said cathode ray tube controller for synchronizing said pulses,

whereby said eight-color CDM is converted to display as many colors as a twenty-seven color CDM.

4,516,119

LOGIC SIGNAL DISPLAY APPARATUS

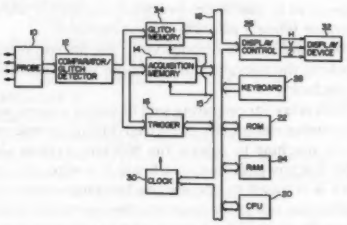
Minoru Fukuta, Tokyo, Japan, assignor to Sony/Tektronix Corporation, Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 420,141

Claims priority, application Japan, Dec. 17, 1981, 56/204170

Int. Cl.³ G09G 1/16

U.S. Cl. 340—722 **4 Claims**



1. An apparatus for displaying a logic signal waveform on a display device comprising:

means for storing a plurality of predetermined basic patterns corresponding to segments of said logic signal waveform, each of said basic patterns being M×N bits where M is an integer greater than or equal to three corresponding to the number of raster lines of said logic signal waveform and N is an integer corresponding to the width of each of said segments, the N logic levels of corresponding upper (M=1) and lower (M=M) raster lines of said basic pattern being determined according to the logic levels of said logic signal waveform, said upper and lower raster lines having reverse logic level with respect to each other, and the N logic levels of corresponding intermediate (M<M<1) raster lines being the same as the logic levels of one of said corresponding upper and lower raster lines;

means for selectively reading said basic patterns from said storing means determined by said logic signal waveform; and

means for generating an output signal based upon said basic pattern, said output signal having a transition output for said intermediate raster lines based upon a comparison of the present bit with the former bit of said intermediate raster line and having an output for said upper and lower raster lines based upon the logic levels of said upper and lower raster lines such that said logic signal waveform is displayed according to said output signal.

4,516,120

DISPLAY DEVICE

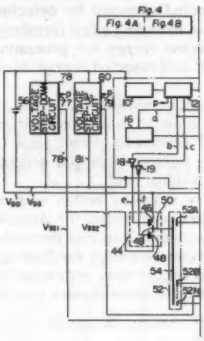
Masao Sakuyama, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

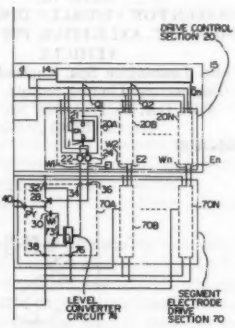
Filed Jan. 6, 1982, Ser. No. 337,224

Claims priority, application Japan, Jan. 12, 1981, 56-2885; Feb. 24, 1981, 56-25732

Int. Cl.³ G09G 3/34

U.S. Cl. 340—785 **7 Claims**





1. A display device, comprising:

an electrochromic display cell having a common electrode and at least one segment electrode with a display segment corresponding thereto;

common electrode drive circuit means for applying periodically varying drive voltages to said common electrode;

segment electrode drive circuit means operable to apply drive voltages to said segment electrode in a predetermined timing relationship with said common electrode drive voltages for thereby selectively applying a first potential difference between said common electrode and segment electrode of appropriate polarity and amplitude to produce coloration of said display segment and a second potential difference between said common electrode

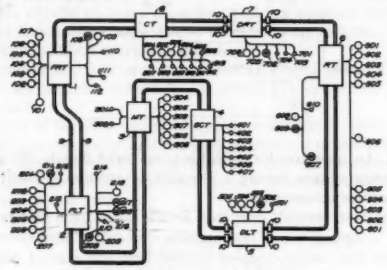
and segment electrode of opposite polarity to said first potential difference and appropriate amplitude to produce bleaching of said display segment, said segment electrode drive circuit means comprising a coloration drive transistor coupled to said segment electrode, operable to be selectively set in a conducting condition to establish said first potential difference between said common electrode and segment electrode and moreover comprising circuit means operable upon establishment of said coloration condition for coupling a control electrode of said coloration drive transistor to a bias potential of suitable polarity for biasing said coloration drive transistor into a non-conductive state and whose value is a negative quantity whose absolute amplitude is equal to or less than the sum of the absolute amplitudes of said first potential difference and second potential difference applied between said common electrode and segment electrode.

4,516,121

TRANSMISSION CONTROL SYSTEM

Masakazu Moriyama; Toshio Shinohara, both of Toyota; Kazuo Hirano, and Fumio Makino, both of Osaka, all of Japan, assignors to Toyota Motor Co., Ltd., Toyota and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Jun. 4, 1982, Ser. No. 385,318
Claims priority, application Japan, Jun. 18, 1981, 56-92968
Int. Cl.³ H04Q *9/00*; B60Q *1/00*
U.S. Cl. 340—825.05 **8 Claims**



1. In a transmission control system for data transmission wherein multiple devices share one circuit so that each of the devices may transmit data on the circuit according to a predetermined transmission sequence, the improvement wherein each device comprises a first detecting means to detect an immediately preceding transmission signal from another device in said predetermined transmission sequence, a second detecting means to detect a further preceding transmission signal from another device in said predetermined transmission sequence, and means for starting successive transmissions in response either to detecting, by said first detecting means, a transmission signal from said immediately preceding signal or after a predetermined time by detecting a next preceding transmission signal from still another device, whereby substantially continuous transmission is accomplished without delay due to failure of any device used in the sequential transmission of said signals.

4,516,122

COMMUNICATION SYSTEM WITH COLLISION DETECTION AND FORCED COLLISION

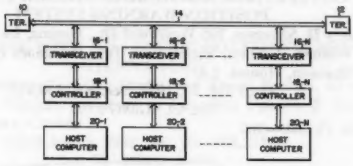
Masataka Tomikawa, Tokorozawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 1, 1982, Ser. No. 413,897
Claims priority, application Japan, Sep. 9, 1981, 56-141062
Int. Cl.³ H04Q *9/00*; H04J *3/00*
U.S. Cl. 340—825.5 **11 Claims**

1. A communication system for a local network interconnecting a plurality of computer units comprising:

a common bus line; and

controllers, each connected between a respective computer unit and said common bus, for controlling access to the bus line, each controller including a collision detector for detecting a frame collision on the bus line, each controller including means for transmitting, when a request for transmission is supplied and a collision is not detected, a text frame and a first dummy frame immediately following said text frame, said first dummy frame being transmitted until



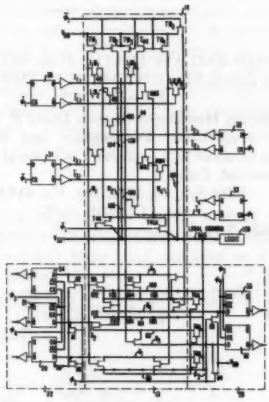
a collision is detected, each of said controllers including means for transmitting, when a text frame is received, a second dummy frame from a time of completion of the text frame reception till a later one of the times when a collision state is no longer detected and when it is ready to transmit an acknowledgement frame and said acknowledgement frame is transmitted immediately after said second dummy frame.

4,516,123

INTEGRATED CIRCUIT INCLUDING LOGIC ARRAY WITH DISTRIBUTED GROUND CONNECTIONS

Masakazu Shoji, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1982, Ser. No. 453,180
Int. Cl.³ H04Q *3/00*; H03K *19/20*
U.S. Cl. 340—825.86 **8 Claims**



5. An integrated circuit structure comprising a layer of semiconductor material and a first linear array of electrical conductors separated from said layer by a first insulating layer, said structure including a second linear array of electrical conductors oriented transverse to said first linear array, said first and second arrays including an insulating layer therebetween and defining cross-points with conductors of said first array, a pattern of transistors located at selected ones of said cross-points each having source, gate and drain electrodes, each of said transistors having its gate and source electrodes connected to a conductor of said first and second linear arrays, respectively, means for controllably raising said conductors of said second linear array to a first voltage level and means for

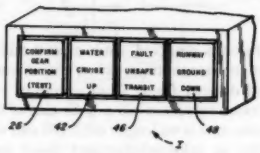
selectively activating ones of said pattern of transistors in a manner to discharge selected conductors of said second linear array, said structure also including a third linear array of conductors having conductors parallel to at least two conductors of said second linear array, and a plurality of ohmic connections between each conductor of said third array and said first layer.

4,516,124

CONVERTIBLE AMPHIBIOUS AIRCRAFT WHEEL POSITION WARNING SYSTEM

Harry D. Shannon, 105 Westwood Dr., Houma, La. 70360, and William P. Lutts, Richardson, Tex., assignors to Harry D. Shannon, Houma, La.

Filed Jul. 22, 1982, Ser. No. 400,973
Int. Cl.³ G08G 5/00
U.S. Cl. 340—960 **11 Claims**



1. An apparatus for warning the pilot of an amphibious aircraft with retractable landing gear of the status of the landing gear comprising:

(a) prompting means for warning the pilot that the aircraft is in a speed transition;

(b) input means for receiving an indication from the pilot designating, in response to said prompting means, whether a landing is selected to be on land or on water;

(c) means for sensing the position of the landing gear;

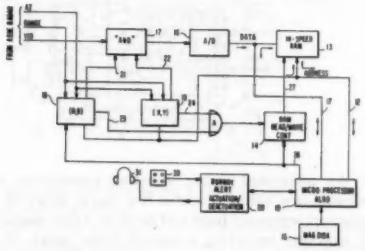
(d) alarm means for indicating to the pilot if the retractable landing gear is properly placed for the selected landing.

4,516,125

METHOD AND APPARATUS FOR MONITORING VEHICLE GROUND MOVEMENT IN THE VICINITY OF AN AIRPORT

Carl E. Schwab, Huntington Station; David P. Rost, Malverne; William Hackenberg, Farmingdale, and Paul Holcombe, Huntington, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 419,886
Int. Cl.³ G01S 13/52
U.S. Cl. 343—7.7 **17 Claims**



1. Apparatus for processing radar return video signals in the vicinity of an airport including at least one runway and at least one vehicle roadway intersecting said runway, said apparatus comprising:

first means responsive to a command input representing a selected function and a selected runway to select a set of geographical monitored locations from plural sets of monitored locations,

second means responsive to a real time video signal from a radar apparatus for repeatedly isolating radar returns from each geographic monitored location in said selected set,

third means for repeatedly comparing radar returns from each of plural geographic monitored locations with a simulated return for each corresponding location to detect a moving object at any of said geographical monitored locations, and

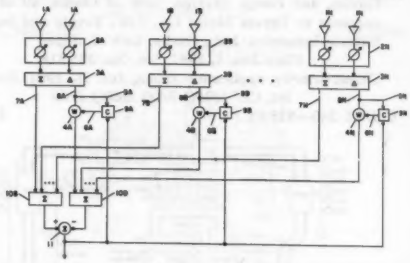
alarm means responsive to detection of a moving object by said third means for alerting an operator to the presence of said moving object.

4,516,126

ADAPTIVE ARRAY HAVING AN AUXILIARY CHANNEL NOTCHED PATTERN IN THE STEERED BEAM DIRECTION

Raymond J. Masak, East Northport, and Anthony M. Kowalski, Miller Place, both of N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,543
Int. Cl.³ G01S 3/16, 3/28
U.S. Cl. 343—383 **6 Claims**



1. An apparatus for cancelling undesired signals affecting an antenna system having a plurality of antenna elements, said apparatus comprising:

(a) first, second, third and fourth ports, each said port for coupling one of said antenna elements of said system;

(b) first means coupled to said first and second ports for providing a first sum signal at a first sum port representing a first sum of signals provided to said first and second ports by the antenna elements coupled thereto and for providing a first difference signal at a first difference port representing a first difference of signals provided to said first and second antenna ports;

(c) a first adaptive control loop coupled to the first difference port and having an output providing a first difference output signal corresponding to the first difference signal; and

(d) second means coupled to said third and fourth ports for providing a second sum signal at a second sum port representing a second sum of signals provided to said third and fourth ports by the antenna elements coupled thereto and for providing a second difference signal at a second difference port representing a second difference of signals provided to said third and fourth antenna ports;

(e) a second adaptive control loop coupled to the second difference port and having an output providing a second difference output signal corresponding to the second difference signal;

(f) means for summing the first sum signal and the second sum signal and having an output providing a total sum signal;

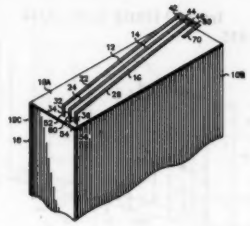
(g) means for summing the first difference output signal and the second difference output signal and having an output providing a total difference signal; and

(h) means for adding the total difference signal and the total sum signal, said means for adding having an output port associated with said first and second control loops.

4,516,127
THREE ELEMENT LOW PROFILE ANTENNA

Kazimierz Siwiak, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1983, Ser. No. 489,893
Int. Cl.³ H01Q 1/48
U.S. Cl. 343—702 6 Claims



1. An antenna comprising:

a counterpoise of electrically conductive material having a first surface;

first, second, and third L-shaped elements, each of said elements having respective leg and foot portions and ends, the leg portions of each of said elements being oriented substantially parallel to each other and in a plane substantially parallel to, and a predetermined first distance above said first surface, said second element being situated between said first and third elements,

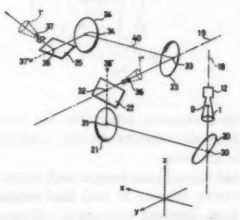
the ends of said first, second, and third elements situated on the leg portions thereof being electrically connected together,

the ends of said first and third elements situated on the foot portions thereof being electrically connected to said counterpoise and together with the end of said second element situated on the foot portion thereof constituting the feedpoint of said antenna.

4,516,128
BEAM WAVEGUIDE FEEDER

Fumio Watanabe; Yoshihiko Mizuguchi, and Matsuichi Yamada, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1983, Ser. No. 457,608
Claims priority, application Japan, Feb. 15, 1982, 57-22295
Int. Cl.³ H01Q 19/18, 3/12
U.S. Cl. 343—761 3 Claims

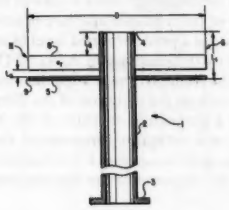


1. A beam waveguide feeder comprising a feed horn, a pair of revolution quadric surface reflectors facing each other, said quadric surface reflectors being identical in focal distance and off-set angle and having their focuses and the reflection points of center beams on the same plane, and at least one plane reflector, said reflectors being arranged relative to said feed horn to form a continuous electric wave path in sequence from said feed horn to one and then the other of said pair of quadric surface reflectors, and then from said other of said quadric surface reflectors to said plane reflector; said feeder further comprising means for moving said quadric reflectors toward and away from one another parallel to a line that passes through the focuses of said revolution quadric surface reflectors, means for turning said plane reflector in an arbitrary direction at an arbitrary position, and means for turning said pair of revolution quadric surface reflectors and said plane reflector as a unit around a revolution axis that is defined by the beam center axis of said feed horn.

4,516,129
WAVEGUIDE WITH DIELECTRIC COATED FLANGE ANTENNA FEED

Apisak Ittipiboon; Lotfollah Shafai, and Ernest Bridges, all of Winnipeg, Canada, assignors to Canadian Patents & Dev. Ltd., Ottawa, Canada

Filed Jun. 4, 1982, Ser. No. 385,251
Int. Cl.³ H01Q 13/00
U.S. Cl. 343—772 2 Claims



1. A feed for a reflector paraboloid antenna comprising:

a circular waveguide with a first end having an electrical coupler and a second radiating end:

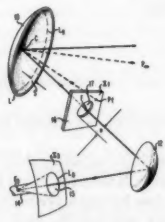
an annular conductive planar flange having an outside diameter $D \geqq 5\lambda$ positioned about the waveguide at a distance $L_1 \geqq \lambda$ from the radiating end where λ is the wavelength of the operating frequency of the antenna; and

an annular dielectric element consisting of two layers of dielectric material and having an outside diameter $\geqq D$ positioned adjacent the flange between the flange and the radiating end to establish a predetermined surface impedance seen by the waveguide.

4,516,130
ANTENNA ARRANGEMENTS USING FOCAL PLANE FILTERING FOR REDUCING SIDELOBES

Corrado Dragone, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 9, 1982, Ser. No. 356,386
Int. Cl.³ H01Q 19/19
U.S. Cl. 343—781 P 3 Claims



1. An antenna arrangement having substantially reduced sidelobes comprising:

a plurality of reflectors arranged confocally in sequence

along a feed axis of the arrangement, each reflector comprising a curved focusing reflecting surface and at least one focal point where each focal point can be either one of a real and an imaginary form, one of the plurality of reflectors being a main reflector comprising a reflecting surface which forms an aperture of the antenna arrangement;

a feedhorn capable of launching a spherical beam comprising a central ray from the apex of the feedhorn disposed on a first focal point of the plurality of confocally arranged reflectors, the feedhorn including a predetermined aperture with a predetermined illumination; and

a filtering means disposed at one of the focal points of the plurality of reflectors, said one of the focal points being a real focal point disposed between two sequential reflectors, the filtering means being capable of passing therethrough, the central ray launched by the feedhorn for producing an image of the feedhorn aperture illumination at the aperture of the antenna arrangement which includes smoothened-out discontinuities at the edge of the image, said main reflector reflecting surface being oversized with respect to the diameter of the feedhorn image to intersect the image of the feedhorn aperture illumination in a manner to produce a predetermined level of edge intensity, A, as defined by the relationship $A/A_g = F(V,S)$ where A_g is a level of the feedhorn image edge illumination at the main reflector without the inclusion of the filtering means, V is a value of a normalized aperture of the filtering means, S is a value of a normalized increase in the main reflector diameter to generate A, and F is a function which is determined by the response of the filtering means.

4,516,131

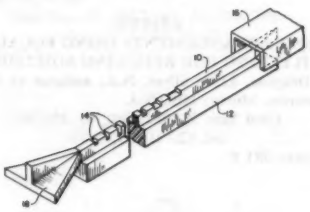
VARIABLE SLOT CONDUCTANCE DIELECTRIC ANTENNA AND METHOD

William T. Bayha; John Borowick, both of Bricktown; Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, all of N.J., assignors to The United States of America represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1983, Ser. No. 463,799

Int. Cl.³ H01Q *13/28*

U.S. Cl. 343—785 **9 Claims**



1. A variable slot conductance dielectric antenna comprising:

a section of dielectric waveguide having input and output ends; and

a plurality of periodic radiating slots formed in the surface of said waveguide as an array along the length of said waveguide, said slots having a predetermined uniform periodic spacing along said length, each slot having a predetermined width and depth dimension, said width and depth dimensions being selectively non-uniform to control the conductance of each of said slots and the radiation pattern along the length of said waveguide.

4,516,132

ANTENNA WITH A REFLECTOR OF OPEN CONSTRUCTION

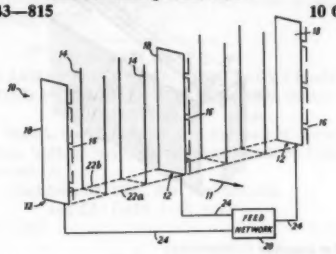
Kevin Bond, Harlow, and Brian W. Watson, Sawbridgeworth, both of England, assignors to Cossar Electronics Limited, Harlow, England

Filed Jun. 16, 1983, Ser. No. 505,372

Claims priority, application United Kingdom, Feb. 24, 1983, 8305196

Int. Cl.³ H01Q *9/28, 15/14*

U.S. Cl. 343—815 **10 Claims**



1. An antenna comprising a plurality of radiating columns and a plurality of conducting rods, said radiating columns being disposed in a line and extending transversely to said line, a first set of said conducting rods being parallel to said radiating columns and disposed in a line to form a first reflecting array, and a second set of said conducting rods being parallel to said radiating columns and disposed in a line to form a second reflecting array, said second array being spaced behind said first array relative to the look direction of the antenna.

4,516,133

ANTENNA ELEMENT HAVING NON-FEED CONDUCTIVE LOOP SURROUNDING RADIATING ELEMENT

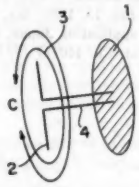
Shigeru Matsumoto; Yoshikatsu Okabe, and Yasuhiro Kazama, all of Mitaka, Japan, assignors to Japan Radio Company, Limited, Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,343

Claims priority, application Japan, Sep. 9, 1981, 56-141831

Int. Cl.³ H01Q *1/52, 19/19*

U.S. Cl. 343—819 **7 Claims**



1. An antenna element adaptable for use as a primary antenna in a parabolic antenna system, comprising:

a feed dipole antenna,

a reflector having a finite length and supported in spaced-apart operative relation to said feed dipole antenna, and

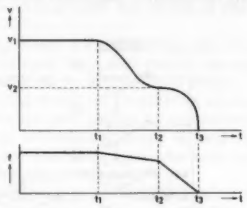
a non-feed loop element stationarily disposed around said dipole antenna generally in parallel with said reflector and electrically insulated from both said dipole antenna and said reflector, said non-feed loop element being a closed and endless loop element of a wire-like thin conductor material in the plane of said dipole antenna,

wherein said non-feed loop element is of a shape and circumferential length selected to increase the H-plane directivity of said feed dipole antenna and said reflector in the absence of said non-feed loop element, in the proximity of the directions of extension of said reflector.

4,516,134
INK JET PRINTER SHUT-DOWN CONTROL

Masayoshi Tamai; Tetsuo Iyoda, and Yukihasa Koizumi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Jul. 28, 1983, Ser. No. 518,261
Claims priority, application Japan, Oct. 22, 1982, 57-185863
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—75 3 Claims



1. In an ink jet printer of the type including an ink supply and a drop forming device for receiving ink and for forming ink drops at a frequency in accordance with a control signal, a drop formation control device comprising:

ink jet means for conducting charge-to-deflect ink printing;

ink supply means for supplying ink to said ink jet means;

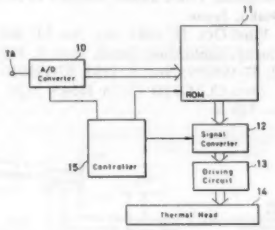
monitoring means for monitoring the flow of ink through said drop forming device; and

control means for gradually reducing the drop formation frequency from a normal operating value to a lower value at the end of a printing operation in response to a corresponding decrease in the monitored ink flow.

4,516,135
THERMAL PRINTER CAPABLE OF REPRODUCING HALFTONE IMAGE

Hidemasa Todoh, Hongo Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,627
Claims priority, application Japan, Mar. 19, 1982, 57-44206
Int. Cl.[3] B41S *3/02*
U.S. Cl. 346—76 PH 6 Claims



1. A thermal printer capable of reproducing halftone images, comprising:

a heater element for outputting heat onto a receiving paper, the quantity of said heat

corresponding to the energy of an electric signal to be impressed thereto;

address signal forming means for forming an address signal corresponding to the content of tone gradation data;

memory means, having prestored therein at associated memory address locations a set of values of electric energy respectively required for reproducing image tone gradations corresponding to certain values of tone gradation data, for outputting the value of electric energy stored at the memory address location specified by said corresponding address signal;

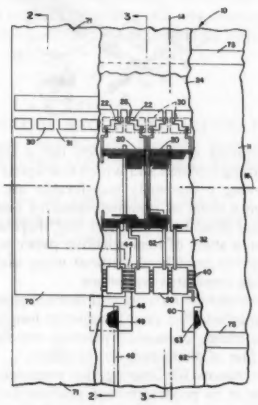
signal generating means for generating said electric signal having energy corresponding to the value of electric energy outputted from said memory means; and

driving means for driving said heater element based on said electric signal.

4,516,136
THERMAL PRINT HEAD

Charles R. Willcox, Buffalo Grove, Ill., assignor to AT&T Teletype Corporation, Skokie, Ill.

Filed Jun. 27, 1983, Ser. No. 508,315
Int. Cl.[3] H05B *1/00*
U.S. Cl. 346—76 PH 5 Claims



1. A thermal print head (**10**) for producing indicia on thermally sensitive paper, including a planar substrate (**12**) providing a support surface, the support surface having a first axis (**14**) and a second axis (**16**) generally perpendicular to the first axis (**14**), comprising:

a plurality of logic units (**50**) for receiving and storing input signals including signals representative of indicia to be produced on the paper, said logic units being positioned consecutively along a line parallel to said second axis (**16**);

a plurality of parallel conductors (**40**) connected to said logic unit and substantially parallel to said second axis (**16**) for supplying data to said logic unit (**50**);

a plurality of driver transistors (**20**), each of which includes a control element connected to one of said logic units and controlled by output signals from said logic units (**50**), said driver transistors (**20**) being positioned consecutively along a line parallel to said second axis (**16**);

a power source including first and secnd conductive busses (**24**, **32**);

a plurality of heater resistors (**22**) connected to the output of said driver transistor (**20**), said driver transistor in response to said signals of said logic unit (**50**) provides a low impedance path through said heater resistor (**22**) between said busses (**24**, **32**), said heater resistor (**22**) being positioned consecutively along a line substantially parallel to said second axis (**14**);

said first buss (**24**) being adjacent to and extending along said heater resistors (**22**) in a line parallel to said second axis (**16**), said second buss (**32**) being adjacent to and extending along said driver transistors (**20**) and connected to each of said driver transistors (**20**);

said second buss (**32**) is positioned between said logic units (**50**) and said driver transistors (**20**); and

the control electrodes of said driver transistors (**20**) are connected to their respective logic units (**50**) by corresponding conductor (**52**) insulated from and passing over said second buss (**32**).

4,516,137

THERMAL PRINT HEAD FOR HEAT OR NON-HEAT-SENSITIVE PAPER

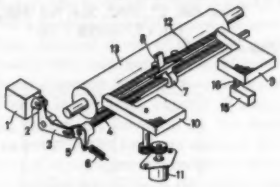
Tsuneo Yasui, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 22, 1983, Ser. No. 564,311

Claims priority, application Japan, Dec. 28, 1982, 57-231008

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **6 Claims**



1. A printing apparatus which has a thermal print head movable along a platen and which is adapted to hold a thermal ribbon having a thermally transferable ink layer, wherein a printing on a sheet of non-heat-sensitive paper is effected by said thermal print head through said thermal ribbon, while a printing on a sheet of heat-sensitive paper is effected directly by the thermal print head without using said thermal ribbon, said printing apparatus comprises:

a drive circuit for moving said thermal print head along said platen in selected one of opposite longitudinal directions of the platen upon each printing movement for printing each line of characters on the paper;

detector means for sensing the presence of said thermal ribbon at its predetermined position for checking if said thermal ribbon is usable or not, said detector means generating a signal according to the presence and absence of said thermal ribbon at said predetermined position; and

control means, responsive to said signal from said detector means, for selecting a unidirectional printing mode in which the printing movements of said thermal print head take place in a predetermined one of said opposite longitudinal directions for all lines of characters to be printed, or a bidirectional printing mode in which the printing movements of the same may take place in either one of said opposite longitudinal directions, said control means controlling said drive circuit to operate in said unidirectional printing mode while said thermal ribbon is sensed by said detector means, and to operate in said bidirectional printing mode while said ribbon is not sensed by said detector means.

4,516,138

TIME-CLOCK RECORDING AND COMPUTATION APPARATUS WITH OPTIONAL REST PROCESSING FUNCTION

Hiroshi Iwasawa; Masanori Numata, and Shinichi Mama, all of Yokohama, Japan, assignors to Amano Corporation, Yokohama, Japan

Filed Oct. 19, 1983, Ser. No. 543,941

Claims priority, application Japan, Oct. 20, 1982, 57-184082

Int. Cl.³ G06K *1/00*

U.S. Cl. 346—80 **12 Claims**

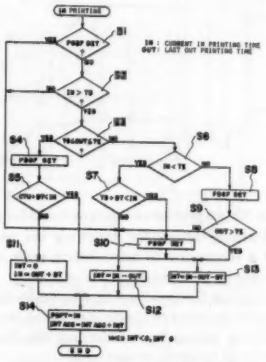
1. In a time-clock recording and computation apparatus including a card driving mechanism for guiding a time card inserted into a card pocket every entering and leaving to a predetermined portion located within the apparatus, card reader means for reading out preetermined identification codes, such as personal codes described on the time card guided thereto, and computation means including a data storage unit in which attendance data based on a predetermined attendance system are stored, and a processing unit effecting predetermined calculation on the basis of the data read out by the card reader means and the attendance data fed from the data storage unit, so as to thereby effect a desired printing on the time card on the basis of the output of the processing unit,

the improvement comprising means for effecting optional rest processing provided in said computation means,

said optional rest processing means operative to execute predetermined processing and including means for:

(a) storing parameters with respect to an optional rest in said data storage unit,

(b) effecting comparative judgement between the data indicative of entering and leaving with respect to each user and optional rest processing patterns determined by setting said parameters said proccessing unit,



(c) sequentially summing up in said data storage unit the processed results obtained by the comparative judgement effected in said processing unit, and

(d) determining whether or not the actual optional rest taken by each user is suitable with respect to said attendance system, and outputting a time condition with respect to optional rest on the basis of said summed up data.

4,516,139

PRINT CONTROL SYSTEM IN A COLOR IMAGE PRINTER

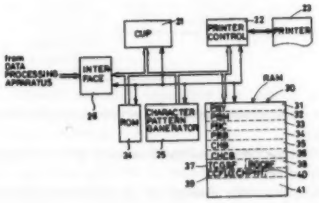
Masahiro Takiguchi, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 31, 1983, Ser. No. 547,401

Claims priority, application Japan, Nov. 5, 1982, 57-195008; Nov. 5, 1982, 57-195009; Nov. 5, 1982, 57-195010

Int. Cl.³ G01D *15/16;* **H04N** *1/22*

U.S. Cl. 346—140 R **4 Claims**



1. A print control system for a color image printer having a printer head including a plurality of printing elements of different colors for printing multi-color image on a second receiving medium, said print control system comprising:

first storing means for storing image pattern information;

second storing means for storing character code information;

a pattern generator developing a character pattern data in accordance with the character code information stored in said second storing means;

third storing means for storing color data for each character code information;

a plurality of print buffers, each of the print buffers being associated with one of said plurality of printing elements;

selection means for selecting one of said print buffers in accordance with said color data stored in said third storing means;

first transferring means for transferring said character pattern data developed from said pattern generator to the print buffer selected by said selection means;

second transferring means for transferring an image pattern data to a selected print buffer in accordance with said image pattern information stored in said first storage means, thereby combining said character pattern data with said image pattern data;

said second transferring means including priority determining means for applying a priority to said character pattern data rather than said image pattern data when said image pattern data has an imaging point which overlaps a printing point determined by said character pattern data;

third transferring means for transferring a combined pattern data stored in said print buffers to said printer head;

background pattern forming means for providing a background pattern;

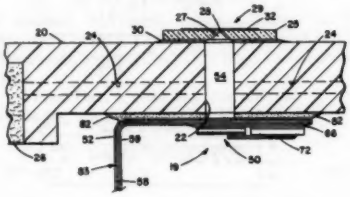
said background pattern forming means including inverting means for inverting said character pattern data developed from said pattern generator, thereby obtaining an inverted pattern data; and

fourth transferring means for transferring said inverted pattern data to a selected print buffer in accordance with background color data, thereby combinining said combined pattern data with said inverted pattern data.

4,516,140
PRINT HEAD ACTUATOR FOR AN INK JET PRINTER

David B. Durkee, Arlington Heights; James P. Koller, Vernon Hills, and Robert M. Wentzel, Mundelein, all of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed Dec. 27, 1983, Ser. No. 565,570
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **15 Claims**



1. An actuator (**50**) for the print head of an ink jet printer (**10**) in which droplets of ink (**84**) are discharged through a nozzle orifice (**28**) in a wall of a chamber (**22**) for containing a small quantity of ink (**54**), the actuator (**50**) comprising:

a piezoelectric crystal plate (**60**) having first and second opposing surfaces, said piezoelectric plate (**60**) experiencing a dimensional change when placed in an electrical field;

first and second electrodes (**62, 64**) covering portions of said first and second opposing surfaces of said piezoelectric crystal plate (**60**);

a bending plate (**56**) with a first surface bonded to the surface of said first conductive electrode (**62**);

a thin flexible sheet of insulating material (**52**) having first and second surfaces;

a first surface of said sheet of insulating material (**52**) bonded to a second surface of said bending plate (**56**), said bending plate (**56**) resisting deformation by said piezoelectric crystal plate (**60**) in response to an electrical potential difference applied to said electrodes (**62, 64**);

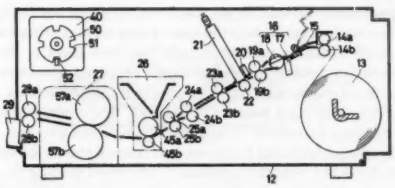
said sheet of insulating material (**52**) being positioned so that said second surface of said sheet of insulating material (**52**) is disposed over an opening in the wall of said chamber (**22**); and

means (**82**) for securing said second surface of said sheet of insulating material (**52**) to the wall of said chamber (**22**) around the periphery of said opening whereby the actuator (**50**) decreases the volume of the chamber (**22**) in response to an electrical potential difference applied across said first and second electrodes (**62, 64**) causing the discharge of droplets of ink (**84**) through said nozzle orifice (**28**).

4,516,141
ELECTROSTATIC RECORDING APPARATUS

Yoshihiro Kawahara, and Kiyoshi Hayashi, both of Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Nov. 23, 1982, Ser. No. 444,817
Claims priority, application Japan, Nov. 30, 1981, 56-192383
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—153.1 **8 Claims**



1. An electrostatic recording apparatus for recording an image on a sheet of recording paper, said apparatus comprising:

an electrostatic recording head for forming an electrostatic image on a sheet of recording paper;

a roller engageable with said electrostatic recording head for pressing the sheet of recording paper against said electrostatic recording head to allow said electrostatic recording head to record an electrostatic image on the sheet of recording paper while the latter is being fed between said electrostatic recording head and said roller;

transport means, located at the downstream side of said electrostatic recording head with respect to the direction of feed of the sheet of recording paper for transporting the sheet of recording paper;

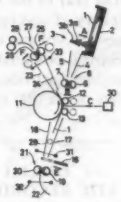
detector means, positioned at the upstream side of said electrostatic recording head with respect to the direction of feed of the sheet of recording paper, for detecting the presence of the latter; and

means, operable in response to said detector means, for rotating said roller immediately when or just before a leading edge of the sheet of recording paper is determined by said detector means to be sandwiched between said recording head and said roller, whereby the sheet is transported between said recording head and roller by said roller, and for stopping rotation of said roller during a period of time after said leading edge of the sheet of recording paper has passed from between said recording head and said roller and has started being transported by said transport means and before the trailing edge of the sheet has been determined by said detector means to have passed between said recording head and said roller, whereafter said roller then is rotated by the sheet being pulled by said transport means.

4,516,142
IMAGE SCANNING APPARATUS

Takaaki Yamamoto, and Yasuhiro Kawai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 5, 1983, Ser. No. 539,243
Claims priority, application Japan, Oct. 6, 1982, 57-175939
Int. Cl.³ G01D *15/00, 15/14*
U.S. Cl. 346—160 4 Claims



1. An image scanning apparatus comprising an auxiliary scanning rotary drum, light source means for emitting a main scanning light beam for scanning a sheet being conveyed by said drum, nip roll means disposed near said light beam scanning position on said drum for movement into and out of engagement with said drum, sheet supplying means for feeding a sheet to be scanned into the space between said drum and said nip roll means in such a manner that said sheet is disposed without any restraint, stopper means arranged downstream of said drum and said nip roller means in the sheet feeding direction for receiving a sheet to be scanned, first control means for controlling movement of said nip roller means into and out of engagement with said drum, second control means for rotating said drum in a direction opposite to the sheet feeding direction and sheet discharging means arranged downstream of said drum relative to the direction in which said sheet is moved by said drum.

4,516,143
SELF-ALIGNED POWER MOSFET WITH INTEGRAL SOURCE-BASE SHORT AND METHODS OF MAKING

Robert P. Love, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 336,972, Jan. 4, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,229
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23.4 10 Claims

1. A double diffused power MOSFET comprising:

a semiconductor substrate including a drain region of one conductivity type and having a principal surface;

a drain terminal electrically connected to said drain region;

a first region of opposite conductivity type formed in said drain region to define a base region, said first region being of limited lateral extent and having a periphery terminating at said principal surface;

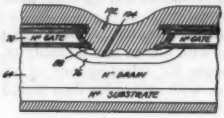
a second region of the once conductivity type formed entirely within and of lesser lateral extent and depth than said first region to define a source region, said second region having a periphery terminating at said principal surface within and spaced from the periphery of said first region such that at said principal surface said first region exists as a band of opposite conductivity type between said source region and said drain region;

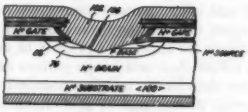
a source terminal electrically connected to said second region;

a gate insulating layer disposed on said principal surface at least over the band of said first region;

a conductive gate electrode disposed on said gate insulating layer at least laterally over the band of said first region;

a gate terminal electrically connected to said gate electrode; and



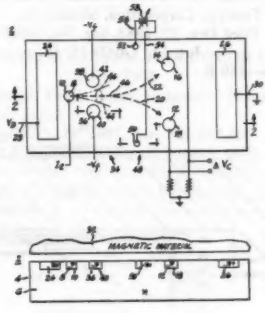


an ohmic short between said first and second regions formed below said principal surface.

4,516,144
COLUMNATED AND TRIMMED MAGNETICALLY SENSITIVE SEMICONDUCTOR

Stanley V. Jaskolski, Sussex; Herman P. Schutten, Milwaukee; Gordon B. Spellman, Mequon; Jan K. Sedivy, Elm Grove, and Maurice W. Jensen, Greendale, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 23, 1982, Ser. No. 421,942
Int. Cl.³ H01L *27/22;* H03K *17/90*
U.S. Cl. 357—27 6 Claims



1. In a magnetically sensitive semiconductor device comprising a substrate including a base region of one conductivity type, an emitter region of opposite conductivity type forming a junction with said base region, a pair of spaced collector regions of said opposite conductivity type each forming a junction with said base region, and means for applying a magnetic field to deflect carriers from said emitter region toward one or the other of said collector regions,

the improvement comprising columnating means between said emitter region and said collector regions for columnating the carriers emitted from said emitter region, said columnating means comprising a pair of spaced auxiliary collector regions of said opposite conductivity type each forming a junction with said base region such that carriers emitted from said emitter region outside a given central angle or cone are collected by said auxiliary collector

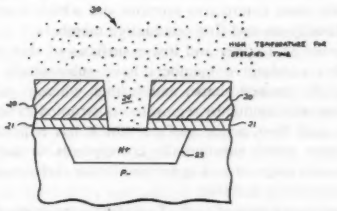
regions and do not reach said first mentioned collector regions, and such that carriers emitted from said emitter region within said central angle or cone pass between said auxiliary collector regions and reach said first mentioned collector regions, whereby to afford a centralized columnated beam of carriers to be deflected by said magnetic field.

4,516,145

REDUCTION OF CONTACT RESISTANCE IN CMOS INTEGRATED CIRCUIT CHIPS AND THE PRODUCT THEREOF

Jenq S. Chang, and Tung S. Chang, both of Santa Clara County, Calif., assignors to Storage Technology Partners, Louisville, Colo.

Filed Aug. 31, 1983, Ser. No. 528,336
Int. Cl.³ H01L *21/324*
U.S. Cl. 357—42 **7 Claims**



1. A method for reducing the contact resistance of the surface area of an N^+ region of a CMOS integrated circuit (IC) chip, which N^+ region is accessed by plasma etching a via through an electrical insulating layer or layers that are deposited over said N^+ region during the manufacturing process of said CMOS chip, said method comprising the steps of:

(a) placing said IC in a relatively inert atmosphere;

(b) elevating the temperature of said inert atmosphere to a temperature range of 900–950° C., for a specified period of time; and

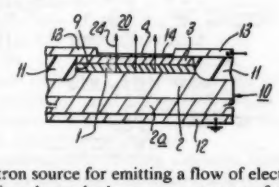
(c) removing said IC from said heated atmosphere and allowing the IC to cool.

4,516,146

ELECTRON SOURCES AND EQUIPMENT HAVING ELECTRON SOURCES

John M. Shannon, Whyteleafe, England; Arthur M. E. Hoeberechts, and Gerardus G. P. Van Gorkom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,144
Claims priority, application United Kingdom, Nov. 6, 1981, 8133501
Int. Cl.³ H01L *29/34*
U.S. Cl. 357—52 **10 Claims**



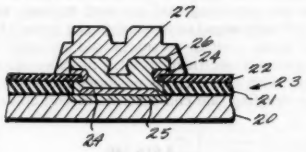
1. An electron source for emitting a flow of electrons, comprising a semiconductor body, an n-p-n structure formed in the body by a p-type first region between n-type second and third regions, electrons being generated in said n-p-n structure for emission from a surface area of said body after flowing from the second region through the first and third regions, characterized in that the n-p-n structure has electrode connections only to said n-type second and third regions, in that the first region provides a barrier region restricting the flow of electrons from the second region to the third region until a potential difference is applied between said electrode connections to bias the third region positive with respect to the second region and to establish a supply of hot electrons injected into said third region with sufficient energy to overcome the surface barrier at said surface area of the body, said barrier region forming depletion layers with both the n-type second and third regions and having such a thickness and doping concentration as to be depleted of holes by the merging together of said depletion layers in the barrier region at least when said potential difference is applied between said electrode connections to establish said supply of hot electrons.

4,516,147

SEMICONDUCTOR DEVICE HAVING A SUBSTRATE COVERED WITH A HIGH IMPURITY CONCENTRATION FIRST POLYCRYSTALLINE LAYER AND THEN A LOWER IMPURITY CONCENTRATION SECOND POLYCRYSTALLINE LAYER

Shigeru Komatsu, Yokohama, and Hiroshi Inoue, Kitakyushuu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 272,918, Jun. 12, 1981, abandoned. This application Feb. 24, 1984, Ser. No. 582,857
Claims priority, application Japan, Jun. 19, 1980, 55-83126
Int. Cl.³ H01L *29/04, 23/48, 29/34*
U.S. Cl. 357—59 **4 Claims**



1. A semiconductor structure comprising:

a semiconductor substrate being of a first conductivity type;

a first insulation layer formed on said substrate and having at least one opening exposing a portion of said substrate;

a second insulation layer formed on said first insulation layer and having at least one opening in a position corresponding to said opening in said first insulation layer, said first and second insulation layers being etchable with different etchants so that said second insulation layer is used as a mask for forming said opening in said first insulation layer by etching, a portion of said second insulation layer overhanging said first insulation layer as a result of said etching;

a first polycrystalline semiconductor layer formed on said exposed substrate and containing impurities associated with a second conductivity type opposite said first conductivity type at a first concentration sufficiently high to convert the conductivity type of said substrate upon diffusion;

a second polycrystalline semiconductor layer formed on said first polycrystalline layer, and containing impurities associated with said second conductivity type at a second concentration lower than said first concentration, the ratio of said first concentration and said second concentration being in the range of 1.5 to 100, said second polycrystalline semiconductor layer being three to ten times thicker than said first polycrystalline semiconductor layer;

a metal electrode formed on said second polycrystalline layer; and

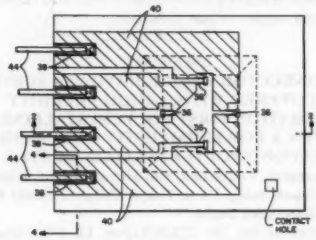
a diffused region being of said second conductivity type formed beneath said first polycrystalline layer in said substrate,

said second polycrystalline layer formed on said first polycrystalline layer prohibiting shorting between said metal electrode and said substrate and preventing breakage with respect to said overhanging portion of said second insulation layer.

4,516,148
SEMICONDUCTOR DEVICE HAVING IMPROVED LEAD ATTACHMENT

Phillip W. Barth, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford, Jr. University, Stanford, Calif.

Filed Aug. 30, 1982, Ser. No. 412,942
Int. Cl.³ H01L *21/60, 21/44*
U.S. Cl. 357—68 **7 Claims**

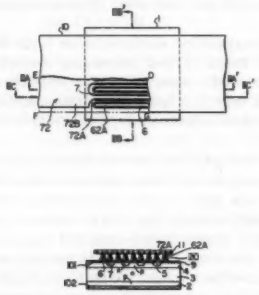


1. A semiconductor device comprising a semiconductor substrate having an electrical circuit formed therein, a plurality of recessed regions formed in peripheral surface portions of said substrate, a second substrate affixed to said semiconductor substrate and overlying said recessed regions, said recessed regions and said second substrate defining tunnels for receiving electrical leads, contact means in said recessed regions and extending to said electrical circuit, a plurality of external electrical leads with end portions positioned in said recesses, and means for bonding said end portions to said contact means.

4,516,149
SEMICONDUCTOR DEVICE HAVING RIBBON ELECTRODE STRUCTURE AND METHOD FOR FABRICATING THE SAME

Yoko Wakui, Ibaraki; Hiroaki Hachino, Hitachi; Mamoru Sawahata, Hitachi; Tasao Soga, Hitachi; Tomio Yasuda, Hitachi, and Michio Ooue, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,905
Claims priority, application Japan, Nov. 4, 1980, 55-153917
Int. Cl.³ H01L *29/74, 23/48, 29/44, 29/52*
U.S. Cl. 357—71 **1 Claim**



1. A semiconductor device comprising:

a semiconductor substrate having a pair of opposite major surfaces and including between said major surfaces a plurality of first semiconductor regions of one conductivity type exposed to one major surface of the substrate, and a second semiconductor region of another conductivity type opposite to said one conductivity type adjacent to said first semiconductor regions and exposed to said one major surface so that said first semiconductor regions are individually separated and surrounded by said second semiconductor region in said one major surface,

a plurality of first conductive members each disposed to have a lower surface thereof directly on and in ohmic contact with said first semiconductor regions, each of said first conductive members having an upper surface having an area of a predetermined shape, and

a second conductive member having a plurality of inner conductive portions which each have a lower surface disposed directly on and bonded conductively to corresponding upper surface portions of said first conductive members, wherein each said lower surface of each of said inner conductive portions has a region having a shape substantially corresponding to the shape of said upper surface of first conductive members to which it is bonded, said second conductive member further comprising a flexible outer conductive portion which is integrated with said inner conductive portions and which is not disposed directly on said first conductive members,

wherein said upper and lower surfaces of said plurality of first conductive members have substantially the same predetermined shape, and further wherein each of said first semiconductor regions is constructed to have an area in said first major surface which has a predetermined shape which substantially corresponds to said predetermined shape of said upper and lower surfaces of said first conductive member,

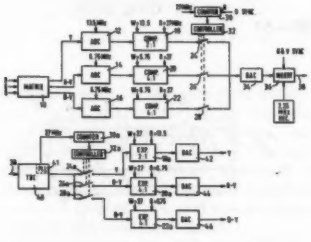
wherein said area of each of said first semiconductor regions in said first major surface is slightly greater than an area of either said upper or lower surfaces of said plurality of first conductive members, and

wherein an area of lower surfaces of each of said regions of said inner conductive portions is slightly less than an area of either said upper or lower surfaces of said plurality of first conductive members.

4,516,150
WORLDWIDE COMPATIBLE SYNCHRONIZING SIGNAL FOR ACCURATE TIME BASE CORRECTION IN AN ANALOG COMPONENT INTERFACE STANDARD

Thomas M. Gurley, Moorestown, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 509,786, Jun. 30, 1983, abandoned. This application Dec. 23, 1983, Ser. No. 565,128
Int. Cl.³ H04N *9/32*
U.S. Cl. 358—13 **14 Claims**

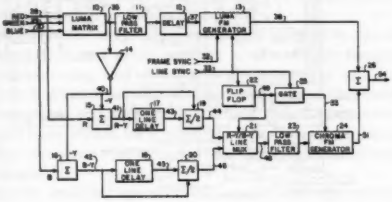


1. A method comprising serially transmitting through a channel time compressed component signals of a color video signal and a reference signal having a frequency of 2.25 MHz or an integer multiple thereof, receiving said signals from said channel, and processing the received component signals using said reference signal.

4,516,151
COLOR SLOW SCAN VIDEO SIGNAL TRANSLATION

John P. Stahler, San Diego, Calif., assignor to Robot Research, Inc., San Diego, Calif.

Filed May 28, 1982, Ser. No. 383,111
Int. Cl.[3] H04N 9/40
U.S. Cl. 358—14 12 Claims



1. A system for translating into three complementary color component slow scan video signals, a composite color slow scan video signal containing a frequency modulated (FM) luminance information signal within a first frequency range of the slow scan video signal frequency band and an FM chrominance information signal within a separate second frequency range of the slow scan video signal frequency band, wherein the chrominance information signal includes a first color difference signal derived by subtracting the luminance information signal from one of three complementary color slow scan video signals and a second color difference signal derived by subtracting the luminance information signal from another of three complementary color slow scan video signals, said system comprising

means for filtering the composite video signal to separate the FM luminance information signal from the FM chrominance information signal;

means for demodulating the FM luminance information signal to retrieve the luminance information signal;

means for demodulating the FM chrominance information signal to retrieve the chrominance information signal;

means for processing the retrieved chrominance information signal to separate and retrieve the first and second color difference signals; and

means for combining the retrieved first and second color difference signals with the retrieved luminance information signal to provide three complementary color component slow scan video signals.

4,516,152
VIDEO SIGNAL PROCESSOR WITH AUTOMATIC KINESCOPE WHITE BALANCE AND BEAM CURRENT LIMITER CONTROL SYSTEMS

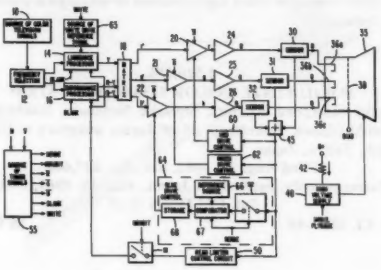
Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed May 23, 1983, Ser. No. 497,157
Int. Cl.[3] H04N 9/535, 9/18, 5/68
U.S. Cl. 358—29 6 Claims

1. In a system including a video channel for processing a video signal containing image information, and an image display device responsive to signals coupled thereto via said video channel, apparatus comprising:

means for automatically limiting excessive beam currents conducted by said image display device in response to said video signal image information, said limiting means providing a beam current limiting control signal to said video channel for controlling the conductive condition of said video channel;

means coupled to said video channel and to said image display device for monitoring the current conduction of said image display device during prescribed monitoring intervals; and

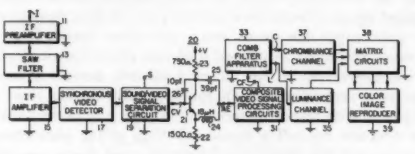


means for inhibiting said beam limiter control signal during said prescribed monitoring intervals.

4,516,153
COMPOSITE VIDEO SIGNAL PROCESSING APPARATUS PROVIDING AMPLITUDE EQUALIZATION

Donald K. Krull, and Saiprasad V. Naimpally, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 30, 1983, Ser. No. 480,507
Int. Cl.[3] H04N 9/535
U.S. Cl. 358—31 8 Claims



1. In a signalling system, wherein (1) a luminance component indicative of the luminance of a color image and occupying a given band of frequencies, and (2) a chrominance component comprising sidebands of a color subcarrier modulated by color difference signals indicative of the coloring of said color image and sharing a portion of said given band adjacent to its high frequency boundary, comprise components of a composite color signal which is subject to processing by signal transfer means presenting an overall frequency response characteristic which exhibits a significant response decline with frequency over a high frequency segment of said band portion inclusive of the frequency of said subcarrier; signal processing apparatus comprising:

signal translating means for subjecting signals applied to its input to: (a) a frequency response characteristic exhibiting a peak response at a out-of-band frequency above said high frequency boundary of said band, and a response rise witth frequency over said high frequency segment of said band portion which is substantially complementary to said response decline, and (b) a group delay of substantially the same magnitude for frequencies throughout said given band;

means for applying the composite color signal output of said signal transfer means to the input of said signal translating means;

luminance component utilization means for controlling the luminance of a reproduction of said color image in accordance with a luminance component derived from the composite color signal output of said signal translating means; and

chrominance component utilization means for controlling the coloring of said reproduction of said color image in accordance with a chrominance component derived from the composite color signal output of said signal translating means.

4,516,154

SOLID STATE COLOR IMAGING SYSTEM

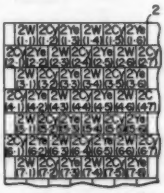
Shigeki Nishizawa, Kodaira; Shusaku Nagahara, Hachioji, and Naoki Ozawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,484

Claims priority, application Japan, Aug. 19, 1981, 56-128761

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **10 Claims**



1. In a solid state color imaging system comprising a number of photoelectric devices arranged regularly and two-dimensionally, horizontal and vertical scanning circuits for controlling the sequential reading of charge signals representative of optical image information from said photoelectric devices onto a signal output line means, and a color filter having filter elements respectively associated with said photoelectric devices, the improvement in that the photoelectric devices in one of any two vertically adjacent photoelectric device rows are displaced with respect to those in the other row in the horizontal direction by half a horizontal pitch of the photoelectric devices, and the three filter elements respectively associated with three photoelectric devices adjacent to one another in said two vertically adjacent photoelectric device rows have transmission characteristics of cyan color transmission, yellow color transmission and panchromatic transmission respectively.

4,516,155

METHOD FOR PARTIALLY SMOOTHING RETOUCH IN ELECTRONIC COLOR REPRODUCTION

Eberhard Hennig, Ascheberg; Jürgen Klie, Toekendorf, and Klaus Wellendorf, Kitzeberg, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Mar. 17, 1982, Ser. No. 358,850

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110222

Int. Cl.³ H04N *1/46*

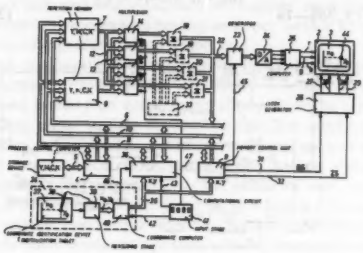
U.S. Cl. 358—80 **17 Claims**

1. A method for partially smoothing retouch of color images in electric color image reproduction, in which the color images are scanned opto-electronically and trichromatically, image point by image point, to obtain color signals, and in which the color signals are digitized into data representing color values (F_1; F_n) for each image point, with said data being stored in a storage device, comprising the steps of:

(a) identifying simultaneously a plurality of image points within a part of the color image to be smoothed, said plurality of image points forming an image point area, said image point area being displacable over the part of the color image to be smoothed;

(b) selecting at least one image point within said image point are, said selected image point forming at least one correction zone within said image point area;

(c) accessing from said storage device the data representing color values of said identified image points; and



(d) changing the data representing color values of the image points within said correction zone in dependence on the color values of image points within sections lying adjacent to said correction zone within said image point area under visual control.

4,516,156

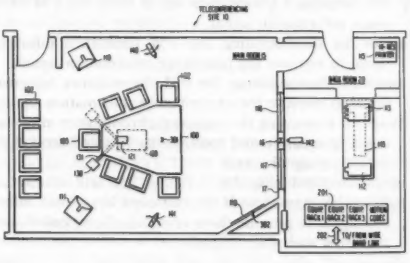
TELECONFERENCING METHOD AND SYSTEM

Alfonso V. Fabris, Oakton; Robert M. Strickland, Jr., and John T. Toth, both of McLean, all of Va., assignors to Satellite Business Systems, McLean, Va.

Filed Mar. 15, 1982, Ser. No. 358,548

Int. Cl.³ H04N *7/14*

U.S. Cl. 358—85 **14 Claims**



1. A teleconferencing system adapted to be connected by a wide band digital communication link for allowing relatively unskilled operators to control a teleconference; comprising at least a pair of teleconferencing site means for transmitting and receiving audio and video representing digital signals therebetween, each said site means comprising:

at least a pair of controllable video source means for deriving a video signal from controllable regions of the associated site,

audio signal source means for deriving an audio signal from the associated site,

at least a pair of video displays for controllably displaying either locally or remotely generated image,

audio transducer means responsive to a remotely generated audio signal for generating perceptible sound,

interface means for coupling digital representations of locally generated audio and video signals to said communication link and for coupling digital representations of remotely generated audio and video signals from said communication link,

control means including a digital microprocessor and video matrix switch means with plural video inputs and outputs

for controllably coupling at least a locally generated video signal to said interface means and for controllably coupling locally and/or remotely generated video signals to said video displays,

said control means, including a control video display and touch sensitive screen for controlling said video source means and video matrix switch means in response to touches on said touch sensitive screen by an operator, said control means including:

logic means for interpreting commands initiated by operator touches of said touch sensitive screen and for thereafter implementing said commands if elements of said commands are consistent with each other and with available resources, and message formatting means responsive to said logic means for formatting digital messages destined for said video source means and said video matrix switch means,

whereby unskilled operators can control said teleconferencing site means.

4,516,157

PORTABLE ELECTRONIC CAMERA

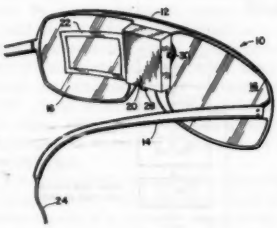
Malcolm G. Campbell, P.O. Box 8760, Ponsonby, Auckland, New Zealand

Filed Oct. 27, 1983, Ser. No. 546,194

Claims priority, application New Zealand, Nov. 23, 1982, 202578; Jan. 13, 1983, 203022

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—108 **9 Claims**



1. An electronic video device comprising:

(a) spectacle means adapted to be worn on a user's head and having a first field of view,

(b) a view-defining means on the spectacle means, through which the user can see the real world directly, and having a second field of view smaller than said first field of view,

(c) a video receptor associated with the spectacle means, and arranged to create a video signal in accordance with only said second field of view, and

(d) a transmitting means for transmitting the video signal from the receptor to a recording or display device.

4,516,158

GROUND RECONNAISSANCE

Richard W. Grainge, and Rowland F. Humphries, both of Hertfordshire, England, assignors to British Aerospace Public Limited Company, London, England

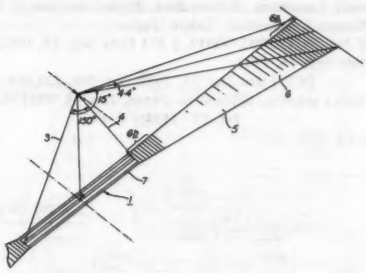
Filed Jul. 30, 1982, Ser. No. 403,815

Claims priority, application United Kingdom, Jul. 31, 1981, 8123582

Int. Cl.³ H04N *5/33, 7/18*

U.S. Cl. 358—109 **7 Claims**

1. Reconnaissance equipment in or for use in an airborne craft or a spacecraft for scanning an area on the ground, and comprising first scanning means which is operable for scanning a part of said area lying beneath and to each side of the craft along lines transverse to the direction of movement of the craft, and second scanning means which is operable for scanning a part of said lying to one side of the craft along lines parallel to said direction of movement.



4,516,159

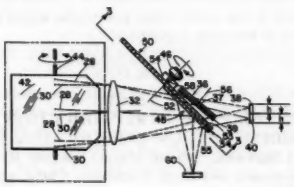
ELEVATION STEP SCANNER

Neal Diepeveen, Fairlawn, N.J., assignor to Magnavox Government and Industrial Electronics, Co., Ft. Wayne, Ind.

Filed Mar. 3, 1983, Ser. No. 471,616

Int. Cl.³ H04N *1/10, 3/08, 1/04*

U.S. Cl. 358—293 **11 Claims**



1. An optical image scanning device comprising:

means for focusing rays of light defining a field of view to produce an image of the field of view in an image plane;

means for detecting light rays, said detector means being arranged in the image plane;

means for scanning the image across the detector means in a scan direction;

a substantially planar disc having a front and a back and an axis perpendicular thereto, a first portion of the disc being reflective to the light rays from the field of view, a second portion of the disc being transmissive to the light rays from the field of view, said disc being arranged in the paths of the light rays from the field of view such that said light rays are incident on the front of the disc and are reflected by the reflective portion to produce an image at a first position in the image plane;

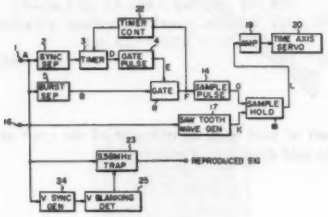
means for rotating the disc on its axis; and

a substantially planar member, reflective to the light rays from the field of view, said reflective member being arranged behind the disc in a fixed position relative thereto such that light rays which pass through the transmissive portion of the disc are incident on the reflective member and are reflected to produce an image at a second position in the image plane, said second position being shifted relative to the first position in a shift direction which is transverse to the scan direction.

4,516,160
INFORMATION RECORDING AND REPRODUCING SYSTEM

Hitoshi Kanamaru, Tokorozawa, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

PCT No. PCT/JP82/00019, § 371 Date Sep. 15, 1982, § 102(e) Date Sep. 15, 1982
PCT Filed Jan. 19, 1982, Ser. No. 420,255
Claims priority, application Japan, Jan. 19, 1981, 56-6907
Int. Cl.³ H04N *9/493*
U.S. Cl. 358—326 **8 Claims**



1. In a color video composite signal recording system, the improvement comprising:

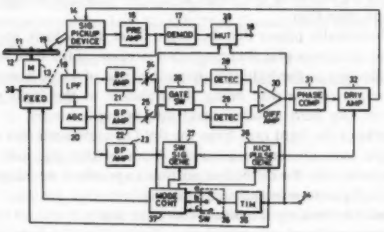
first means for receiving a color video composite signal including luminance, chrominance, and synchronous components; and

second means for adding an additional color burst signal at a predetermined sectional period of each horizontal period within each vertical blanking period of said color video composite signal, said additional color burst signal having the same frequency and phase as a color burst signal contained in the color video composite signal other than the vertical blanking period.

4,516,161
SYSTEM FOR PAUSING REPRODUCTION IN ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sigiyama, Isehara; Masaki Sakurai; Ryozo Abè , both of Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 23, 1982, Ser. No. 401,231
Claims priority, application Japan, Jul. 28, 1981, 56-111837[U]
Int. Cl.³ H04N *5/781*
U.S. Cl. 358—342 **4 Claims**



1. A system in a rotary recording medium reproducing apparatus for pausing reproduction of a rotary recording medium having an information signal recorded on a spiral track, said reproducing apparatus comprising a reproducing transducer having a reproducing element for reproducing a signal from the track on said rotary reproducing medium and kicking means for kicking said reproducing element to an adjacent track in response to a kick pulse applied thereto, said system comprising:

pause mode signal supplying means for supplying a pause signal when said reproducing apparatus is to be put into a pause mode, said reproducing apparatus generating said kick pulse in response to said pause mode signal being supplied thereto so that said reproducing element scans over the same track to carry out a pause operation;

timer means operating in response to the pause mode signal supplied from said pause mode signal supplying means for producing an output signal after a predetermined time period has elapsed; and

mode control means supplied with the output signal of said timer means for cancelling the scanning of the same track by said reproducing element,

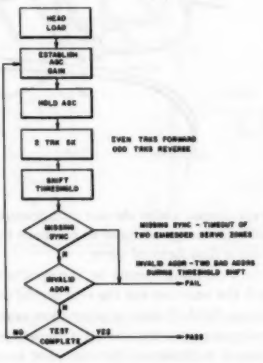
said timer means operating while said pause mode signal is being applied thereto and producing an output signal every time a predetermined time period elapses,

said mode control means advancing said reproducing element which is reproducing said same track turn by one track turn to carry out a frame advance operation every time the output signal of said timer means is applied thereto.

4,516,162
METHOD FOR VERIFYING SERVO DATA

David E. West, Oklahoma City, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 21, 1983, Ser. No. 487,341
Int. Cl.³ G11B *5/02*
U.S. Cl. 360—25 **8 Claims**



6. A method for verifying the integrity of servo data stored as a series of parallel servo tracks on a data storage medium, each track including automatic gain control data and servo data, said method comprising the steps of:

a. generating first automatic gain control pulses dependent upon the automatic gain control data on a first servo track;

b. establishing a first threshold level dependent upon the peak amplitudes of said first automatic gain control pulses;

c. shifting said first threshold level to an enhanced threshold level having an amplitude higher than that of said first threshold level;

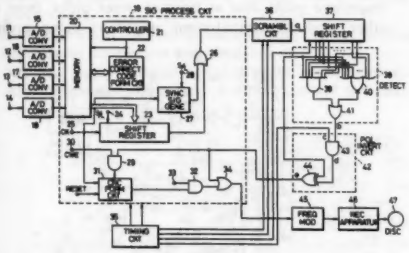
d. generating second servo data pulses dependent upon the servo data on a second servo track; and

e. detecting each of said second servo data pulses having an amplitude at least as high as that of said enhanced threshold level.

4,516,163
DIGITAL INFORMATION SIGNAL RECORDING SYSTEM

Isao Masuda, Sagamihara; Nobuaki Takahashi, Yamato; Kazunori Nishikawa, Machida; Yoshiki Iwasaki, Yokohama, and Shoji Ueno, Zama, all of Japan, assignors to Victor Company of Japan, Japan

Filed Jun. 28, 1983, Ser. No. 508,540
Claims priority, application Japan, Jul. 6, 1982, 57-117377
Int. Cl.³ G11B *5/00, 5/09*
U.S. Cl. 360—32 **6 Claims**



1. A digital information recording system comprising:

a randomized digital signal forming circuit for forming a randomized digital signal by carrying out modulo-2 addition of at least digital information signals of a plurality of channels in a digital signal and a random code sequence which is generated independently, said digital signal being constituted by a predetermined number of words from each of said digital information signals of a plurality of channels, a synchronizing signal, error correcting codes, and an error detecting code, which are time-sequentially multiplexed in terms of signals corresponding to one frame, said digital information signals of a plurality of channels being obtained by independently subjecting analog information signals of a plurality of channels to digital modulation;

a detector for successively detecting values of each of said predetermined number of words from each of said digital information signals of a plurality of channels in said randomized digital signal, in terms of one word, and generating a detection signal only when values of bits in said one word are all "1" or all "0";

a timing circuit for generating a timing signal for every period corresponding to a transmission period of a least significant bit in one word from each of said digital information signals of a plurality of channels;

polarity inverting circuit means for passing said randomized digital signal unchanged during a period in which said detection signal is not generated from said detector, and inverting the polarity of the least significant bit in one word from each of said digital information signals of a plurality of channels in said randomized digital signal when simultaneously applied with said detection signal and said timing signal; and

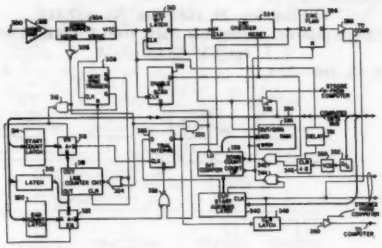
recording means for recording a digital signal obtained from said polarity inverting circuit means.

4,516,164
APPARATUS FOR DECODING VIDEO ADDRESS CODE SIGNALS

Edwin C. Moxon, Boxboro, Mass., assignor to Stypher Corporation, Hudson, Mass.

Filed Oct. 21, 1982, Ser. No. 435,689
Int. Cl.³ G11B *5/02, 5/09*
U.S. Cl. 360—53 **25 Claims**

1. In apparatus for reading coded information recorded on video magnetic tape, said apparatus having means for reading signals from said tape as said tape is run at different speeds, a local oscillator for generating sampling signals of various frequencies, means responsive to said sampling signals for sampling said signals read from said tape to produce received information and an error checking circuit responsive to said



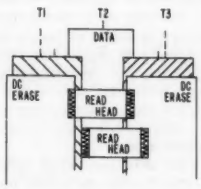
received information for generating a signal indicating an error in the reception of said information, the improvement comprising,

means responsive to said error signal for adjusting the frequency of said sampling signals to produce error-free reception of said information.

4,516,165
ERROR RECOVERY PROCEDURE USING SELECTIVE ERASURE

Earl A. Cunningham, and Dean C. Palmer, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,386
Int. Cl.³ G11B *21/10, 27/08*
U.S. Cl. 360—53 **14 Claims**



1. In a high density hard disk media storage device having a transducer head which reads and writes data, the method of recovering data from the device having magnetically recorded information in a series of adjoining parallel tracks wherein track misregistration has partially obscured the information on a given track comprising:

reading and storing the data from the tracks adjoining either side of said given track,

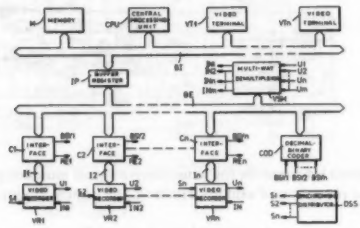
respectively erasing both of said adjoining tracks with said transducer head while offsetting the transducer head toward said given track relative to said adjoining tracks, and

aligning said transducer with said given track and conducting a read operation to recover data from said given track.

4,516,166
DEVICE FOR THE AUTOMATIC COMPUTER-CONTROL OF THE OPERATION OF A PLURALITY OF VIDEORECORDERS

Mauro Tellone, Settimo Torinese, Italy, assignor to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 29, 1982, Ser. No. 427,319
Claims priority, application Italy, Dec. 7, 1981, 68586 A/81
Int. Cl.³ G11B *15/18*
U.S. Cl. 360—72.1 **8 Claims**



1. Apparatus for automatic computer control of the execution of a selected one of a plurality of determined operations in an operating range starting from an entrance frame and ending at an exit frame, by a selected one of a plurality of video recorders each having video tape carrying sequential frame identifying data identifying each television frame recorded thereon, said apparatus comprising:

computer means having stored data comprising a plurality of control unit addresses, digital entrance frame data, digital exit frame data, and operational data signifying said selected one of said determined operations; and

a plurality of control units, each connected to said computer means and to a corresponding one of said video recorders, each addressable by a respective one of said control unit addresses, each comprising:

motion control means for reading out then-present frame identification data from the respective one of said video tapes, receiving said digital entrance and exit frame data from said computer means, generating a tape control signal varying in dependence on the so read-out and received data, and applying said tape control signal to said selected one of said video recorders to control the speed and direction of motion thereof;

first error detecting means receiving said digital entrance frame data and said digital exit frame data from said computer means, for comparing the so-received data, generating a computer error signal when said digital entrance frame data is inconsistent with said digital exit frame data, and applying said computer error signal to said computer means;

and second error detecting means receiving said entrance and exit frame identification data, for applying a restart signal to said motion control means when said selected one of said video recorders is carrying out said selected one of said determined operations outside said operating range.

4,516,167
COMPRESSION OF THE DYNAMIC RANGE OF VIDEO SIGNALS

Donald F. Dion, Burlington, and Michael J. Cantella, Winchester, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,479
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—160 **8 Claims**

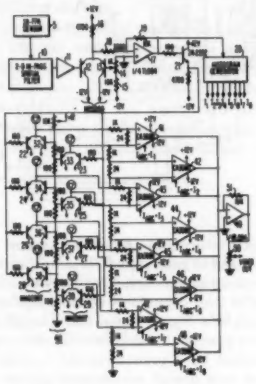
3. A piecewise-linear amplifier in which response is linear over each of a plurality of successive ranges of input signal amplitude, said ranges being n at least three in number, ordinally numbered first through n^{th} in order of increasing amplitude range, which piece-wise-linear amplifier comprises:

an input signal terminal;

an output signal terminal;

a plurality, n in number, of clippers ordinally numbered first through n^{th}, having respective input connections to said input signal terminal and having respective output connections at which are respectively supplied response to zones ordinally numbered with numbers equal to or lower than the ordinal numbers of the respective clippers; and

a plurality, n in number, of differential-input amplifiers with respective gains that at least at times differ from each other, said differential-input amplifiers being ordinally



numbered first through n^{th}, the first said differential-input amplifier having one of its inverting and non-inverting input connections connected to receive a level corresponding to the minimum signal level in said first range and the other of its input connections connected to the output connection of said first clipper, and each of the remaining ones of said differential-input amplifiers having one of its inverting and non-inverting input connections to the output connection of the clipper ordinally numbered the same as it is and the other of its input connections connected to the output connection of the clipper ordinally numbered one less than it is; and

means for summing the output responses of said differential-input amplifiers to obtain the overall response applied to said output signal terminal.

4,516,168
SHUTDOWN CIRCUIT FOR A SWITCHING REGULATOR IN A REMOTE CONTROLLED TELEVISION RECEIVER

James E. Hicks, New Palestine, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,776
Int. Cl.³ H04N *5/44, 3/18*
U.S. Cl. 358—190 **8 Claims**

1. A switching power supply with disabling circuitry, comprising:

a source of input voltage;

a power supply inductance coupled to said input voltage source;

a load circuit coupled to said inductance;

a power switch coupled to said inductance;

a regulator control circuit coupled to said power switch for producing the switching thereof to transfer energy from said input voltage source to said load circuit, said regulator control circuit being responsive to control voltages for

varying the switching duty-cycle of said power switch to control the transfer of energy to said load circuit;

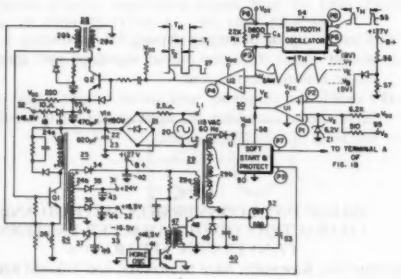
means for developing a first one of said control voltages representative of variations in an energy level of said load circuit to control said duty-cycle in a manner that regulates said energy level;

a disabling circuit coupled to said regulator control circuit and responsive to the voltage at a disabling control terminal for developing a second one of said control voltages that changes said duty-cycle in a manner that disables the normal transfer of energy to said load circuit, said second one control voltage being generated when the disabling control terminal is biased to a voltage that is beyond a given value;

a disabling switch coupled to said disabling control terminal;

a comparator coupled to said disabling switch;

a disabling input terminal coupled to an input terminal of said comparator and to said disabling control terminal;



a first signal generator responsive to a first condition requiring the disablement of said power supply for developing at said disabling input terminal a first bias voltage that exceeds a first value in a first direction in order to bias said disabling control terminal to a voltage that is beyond said given value; and

a second signal generator responsive to a second condition requiring the disablement of said power supply for developing at said disabling input terminal a second bias voltage that exceeds a second value in the direction opposite that of said first direction in order to bias the input terminal of said comparator beyond a first trigger level voltage in a first direction to activate said comparator, said disabling switch changing conductive states when said comparator is activated for biasing said disabling control terminal to a voltage that is beyond said given value.

4,516,169

SYNCHRONIZED SWITCHING REGULATOR FOR A MULTIPLE SCANNING FREQUENCY VIDEO MONITOR

Walter Truskalo, Titusville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 27, 1983, Ser. No. 498,767

Int. Cl.[3] H04N *3/18*

U.S. Cl. 358—190 **8 Claims**

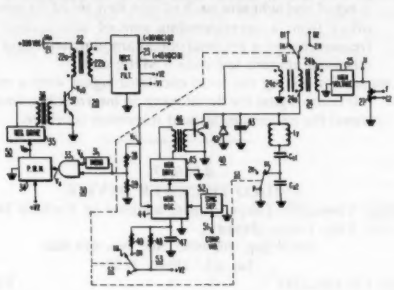
1. In a display system having a multiple rate scanning system, a synchronized switching power supply, comprising:

a deflection circuit for producing scanning current in a deflection winding and capable of being operated at either one of two selectable scanning frequencies;

means for generating a synchronizing signal synchronously related to said scanning circuit;

means responsive to said synchronizing signal for generating a control signal that is synchronously related to said scanning current and of a frequency that is unchanged when said deflection circuit is operated at either of said two scanning frequencies; and

a switching power supply for developing a supply voltage for said display system and which is responsive to said control signal for producing switching operation of said



power supply at said unchanged frequency in synchronism with said scanning current.

4,516,170

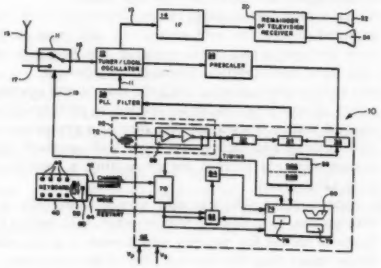
DUAL MODE UHF TUNING SYSTEM

Peter C. Skerlos, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 367,656, Apr. 12, 1982, abandoned. This application Feb. 4, 1984, Ser. No. 564,177

Int. Cl.[3] H04N *5/44*

U.S. Cl. 358—191.1 **10 Claims**



1. A UHF tuning system for a television receiver including a phase locked loop circuit wherein the frequency of a voltage controlled oscillator is locked to a reference signal, said system comprising:

keyboard means for selecting a desired channel number from a first group of channels or from a second group of channels and generating output signals representing said selected channel number;

mode control means selectively operable for identifying either a first mode of operation for tuning to channels in said first group or a second mode of operation for tuning to channels in said second group and for generating first or second control signals in response to said first or second modes of operation, respectively;

signal processing means coupled to said keyboard means and said mode control means and responsive to said channel number output and said control signals respectively received therefrom and coupled to said voltage controlled oscillator for generating a local oscillator signal having one of a plurality of equally spaced first set of frequencies for tuning to a channel in said first group of channels in response to said first mode of operation or for generating a local oscillator signal having one of a plurality of equally spaced second set of frequencies for tuning to a channel in said second group of channels in response to said second

mode of operation, wherein the separation between adjacent frequencies in said first and second sets of frequencies is equal and wherein each of said first set of frequencies is offset from a corresponding one of said second set of frequencies by a predetermined amount, with said predetermined amount less than 6 MHz; and

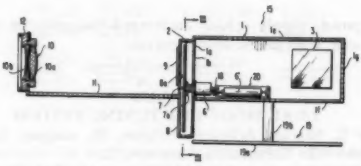
means for mixing the local oscillator signal with a received television signal for developing an intermediate frequency signal for processing in said television receiver.

4,516,171

VIDEO TRANSFER DEVICE

Shogo Yamazaki, Tokyo, Japan, assignor to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 419,900
Int. Cl.³ H04N *3/02*
U.S. Cl. 358—214 **5 Claims**



1. In a video transfer device comprising:

an elongated lightproof housing including opposite front and rear walls,

an aperture within said front wall,

a screen adjacent said front wall aperture,

a mirror within said housing remote from said front wall and inclined 45 degrees with respect to said front wall aperture and projecting light entering the housing through said front wall aperture towards the sidewall,

a sidewall aperture aligned with the mirror and opening to a video camera lens system for recording pictures projected on said screen from a moving film of a projector outside said housing and facing said front wall aperture and said screen adjacent thereto for projecting a transfer image onto said screen,

the improvement wherein said screen comprises a semi-transparent, thin, flexible film member, said device further includes means for moving said screen at a considerably faster speed than the moving film of the projector,

and a close-up lens molunted in front of the screen at a position such that the focal plane of said close-up lens is at the plane of the semi-transparent thin flexible film member and is of substantially reduced size to maintain the device small in size, relatively inexpensive and which considerably reduces the power necessary to move said screen.

4,516,172

SOLID STATE TELEVISION CAMERA WITH IRIS CONTROL

Katsuro Miyata, Yokohama; Takashi Asaida, and Fumio Nagumo, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,571
Claims priority, application Japan, Aug. 10, 1981, 56-125062
Int. Cl.³ H04N *5/16*
U.S. Cl. 358—228 **7 Claims**

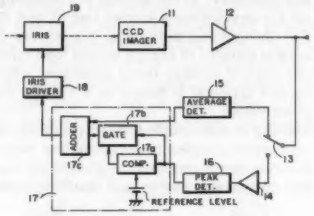
1. A solid state television camera having a solid state image sensing device including a plurality of individual light sensing units arranged in both horizontal and vertical rows and for sequentially generating an output signal corresponding to an image by transferring a charge generated by said light sensing units, said solid state television camera comprising,

(A) a synchronizing signal generator for generating horizontal and vertical synchronizing signals,

(B) a clock pulse generator controlled by said synchronizing signals and for generating various kinds of clock pulses controlling the transfer of the charge generated in said light sensing units,

(C) iris means for controlling the light amount from the image radiated on said light sensing units,

(D) driver means for controlling said iris means,



(E) smear signal detecting means for producing a smear output signal from the output signal of said solid state image sensing device, and

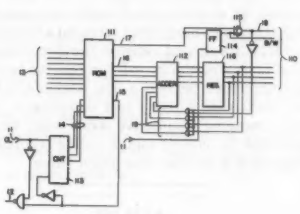
(F) means for supplying said smear output signal to said drive means such that the light amount is controlled by the level of said smear signal.

4,516,173

IMAGE DATA CONVERSION METHOD AND CHARACTER CODE/CHARACTER PATTERN CONVERSION APPARATUS

Susumu Abe, Kawasaki; Akio Munakata, and Takeshi Kitahara, both of Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 1, 1982, Ser. No. 353,334
Claims priority, application Japan, Mar. 6, 1981, 56-32126; Mar. 11, 1981, 56-35034
Int. Cl.³ H04N *7/12*
U.S. Cl. 358—261 **23 Claims**



1. An image data conversion method using a runlength conversion table, calculation means, register means, detecting means and adding means, said method comprising the steps of:

(a) converting the image data into a runlength code using the runlength conversion table where the runlength conversion table holds at least runlength codes in each of a plurality of storing areas corresponding to the image data, the runlength codes including black and white codes;

(b) calculating to output the contents of each of the plural storing areas, where the calculation means is controlled for performing calculations by the output of said runlength conversion table and produces a counting output used as a part of an access address of said runlength conversion table;

(c) storing the runlength code in the register means and temporarily holding the runlength code output from said runlength conversion table therein;

(d) detecting, using the detecting means the change between

white and black codes output from said runlength conversion table; and

(e) adding, using the adding means which outputs the runlength codes to said register means, the content of said register means and the output of said runlength conversion table in accordance with a control by said detecting means when the same kind of runlength codes appear continuously, and thereby converting the image data to the runlength codes through reading once or several times the runlength codes from said runlength conversion table for the given image data signal and adding the runlength codes when the same type of runlength codes appear continuously.

4,516,174

VIDEO SIGNAL REGULATING APPARATUS

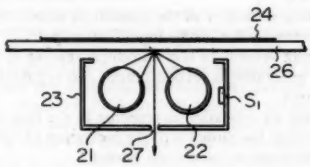
Yoshiaki Kammoto, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,464

Claims priority, application Japan, Mar. 10, 1980, 55-29887; Mar. 12, 1980, 55-31272; Apr. 10, 1980, 55-47367

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—282 **6 Claims**



1. A video signal regulating apparatus including a lamp for illuminating an original document, optoelectric scanning means for scanning the document and producing electrical video signals corresponding to an optical pattern thereof and amplifier means for amplifying the video signals, characterized by comprising:

sensor means comprising a single sensor which is disposed so as to simultaneously receive reflected light from the document and light from the lamp and being connected to the amplifier means, the amplifier means being constructed such that an amplification factor thereof varies in accordance with an output of the sensor means to regulate a level of the video signals to a constant valve.

4,516,175

SCANNING METHOD AND SCANNING DIAPHRAGM FOR SUPPRESSING MOIRé IN THE SCANNING OF RASTERED MASTERS

Eggert Jung, Schoenberg, and Heinrich Wadle, Neumuenster, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,999

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120030

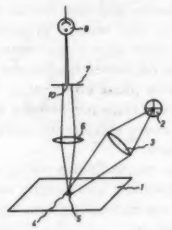
Int. Cl.³ H04M *1/40*

U.S. Cl. 358—283 **6 Claims**

1. A method of scanning in the field of reproduction techniques, particularly in opto-electronic image scanning to prevent Moiré in a recorded image when scanning a rastered master comprising the steps of:

(a) Clamping a master with a raster grid with raster meshes,

(b) Providing an electronic light receiver having a light sensitive surface and a diaphragm with an aperture to allow light, which is emitted by an illuminated master to be received by said sensitive surface to generate an electronic signal for further processing, said aperture having a shape and size corresponding to an elementary cell of a plurality of cells with each of said cells having an arbitrarily contoured area of at least the area of one raster mesh, the raster grid of the master being covered without any overlapping and without gaps by the totality of said elementary cells and each single elementary cell being aligned in such a manner that the relative positioning of elementary cells and raster meshes is constant over the area of the whole master, said clamping of the master



positioning the master with the aperture of said diaphragm being aligned to execute the scanning process approximately parallel to the alignment of the elementary cells in the raster grid of the master, and

(c) Arbitrarily moving the diaphragm and master relative to each other to provide the scanning.

4,516,176

MAGNETIC HEAD CLEANING DISKETTE

Jeffrey B. Street, Sunnyvale, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed May 10, 1982, Ser. No. 376,272

Int. Cl.³ G11B *5/012, 5/41*

U.S. Cl. 360—75 **4 Claims**

1. A diskette for cleaning a magnetic read/write head of a flexible disk drive, said diskette comprising a thin flexible platter, and a mildly abrasive magnetic coating on at least one side of the platter for contacting the read/write head, said coating including magnetite (Fe_3O_4) having an internal crystalline form in the shape of octahedral crystals, conductive carbon black, a dispersing agent, a binder system, a cross linker, and a lubricant, said coating including data, magnetically recorded thereon, which is adapted for directing the read/write head across the diskette surface.

4,516,177

ROTATING RIGID DISK DATA STORAGE DEVICE

William G. Moon, Sunnyvale; Ronald R. Moon, Santa Clara; Bruce R. Peterson, San Jose, and Donald C. Westwood, Cupertino, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 424,914, Sep. 27, 1982, abandoned. This application Mar. 15, 1983, Ser. No. 475,599

Int. Cl.³ G11B *5/55, 5/58*

U.S. Cl. 360—77 **29 Claims**

1. In a data storage device including a base, a plurality of rotating rigid magnetic media data storage disks commonly journalled for rotation to said base, a plurality of read/write data transducers held in close proximity to the major surfaces of said disks by air-bearing effect, and a current operated rotary actuator carriage mechanism journalled to said base and having an axis of rotation parallel with the axis of rotation of said disks, for carrying said transducers and positioning them at one of a multiplicity of concentric data tracks during data read/write operations and for moving said transducers from track to track during track seeking operations of said device, the improvement comprising:

optical encoder means mounted between said carriage mechanism and said base, for providing a plurality of phase related signals indicating transducer position relative to said base;

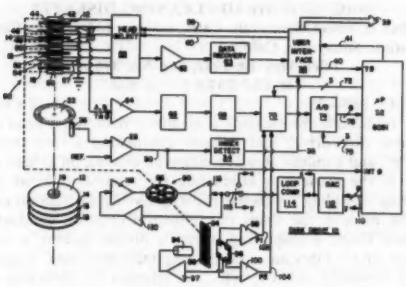
at least one surface of said disks containing a plurality of substantially identical, radially aligned and contiguous servo sectors, each sector prerecorded with a plurality of first bursts offset from track centerline in a first direction for odd numbered tracks and offset from track centerline in a second direction for even numbered tracks, and prerecorded with a plurality of second bursts spatially interleaved between said first bursts and offset from track centerline in said second direction for odd numbered tracks and offset from track centerline in said first direction for even numbered tracks, and wherein said bursts are not necessarily phase coherent;

at least one of said transducers being a servo burst transducer for reading every servo sector during track following of a said data track;

peak detection means connected to said servo burst transducer for detecting and putting out average peak amplitude values for each sector servo burst read by said servo burst transducer;

analog switch means connected to said optical encoder means and to said peak detection means for switching between said plurality of phase related position signals and said peak amplitude values of said servo bursts;

analog to digital converter means connected to said analog switch means for converting each analog signal received therefrom into a digital word;



user interface circuit means for receiving digital disk surface and track selection control data;

tachometer means coupled mechanically to said disks for generating clock signals representing sector boundaries;

programmed digital microprocessor means connected to said tachometer means, said analog to digital converter means, said analog switch means, for receiving digital words from from said analog to digital converter means and said data from said user interface circuit means, for calculating therefrom digital control data words: for commanding said rotary actuator to move from a departure track to a user defined destination track and to settle thereat based on information from said optical encoder means during track seeking, and for commanding said rotary actuator to maintain said data transducers in track centerline alignment based on information from said peak detection means during track following;

digital to analog converter means connected to said microprocessor means for receiving and converting said digital control data words into analog signal values,

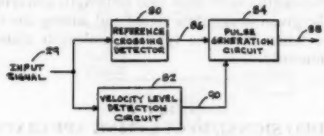
rotary actuator drive amplifier means connected to said digital to analog converter means for receiving said analog signal values, for amplifying them and putting them out to control said carriage mechanism during track following and during track seeking and settling.

4,516,178

CYLINDER CROSSING DETECTION CIRCUIT FOR DISC DRIVE OR THE LIKE

Patrick S. Lee, Campbell, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 15, 1982, Ser. No. 418,492
Int. Cl.³ G11B *21/08*
U.S. Cl. 360—78 **14 Claims**



7. A method for detecting position of a transducer moving with respect to tracks uniformly spaced on a medium and having information thereon, comprising the steps of:

moving the transducer with respect to said tracks, said tranducer generating a position signal with respect to the tracks;

detecting proximity of the transducer to said tracks having information for producing a first output;

detecting velocity of said transducer relative to said medium for generating a second output and regulating the value thereof;

initiating an indication in response to the first output; and,

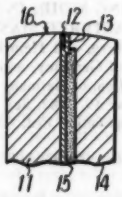
controlling the duration of the indication of the first output in response to the second output.

4,516,179

MAGNETIC TRANSDUCER HEAD UTILIZING MAGNETORESISTANCE EFFECT

Shigeyoshi Imakoshi, Atsugi; Yutaka Soda, Ebina; Hiroyuki Uchida, Atsugi; Junkichi Sugita, Ebina; Hiroshi Takino, Kodaira; Tetsuo Sekiya, and Hideo Suyama, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 408,025
Claims priority, application Japan, Aug. 17, 1981, 56-128337
Int. Cl.³ G11B *5/12*
U.S. Cl. 360—113 **5 Claims**



1. A magnetic transducer head utilizing magnetoresistance effect comprising:

a thin film magnetoresistance effect element held between first and second substrates, at least one of said first and second substrates being formed of a electrically conductive material, and a biasing means for said magnetoresistance effect element to satisfy a potential relation $V_{MR}-V_S \leqq 0.2$ volt, wherein V_{MR} is a potential of said magnetoresistance effect element, and V_S is a potential of said conductive substrate.

4,516,180

THIN FILM MAGNETIC HEAD

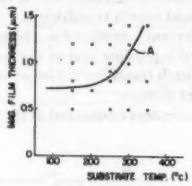
Shinji Narishige; Tsuneo Yoshinari, both of Hitachi; Mituo Sato, Takahagi; Masayuki Takagi, Odawara, and Toshihiro Yoshida, Fujisawa, all of Japan, assignors to Computer Basic Technology Research Assoc., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,176

Claims priority, application Japan, May 15, 1981, 56-72327

Int. Cl.³ G11B *5/16*

U.S. Cl. 360—126 **18 Claims**



1. A thin film magnetic head, comprising:

(a) a lower magnetic member;

(b) an upper magnetic member stacked on said lower magnetic member and formed of laminate of magnetic thin film layers, each magnetic thin film layer having a thickness not higher than 0.8 μm, and non-magnetic thin film layers, each non-magnetic thin film layer having a thickness in a range of 20 Å to 0.04 μm, the magnetic and non-magnetic thin film layers being stacked alternately with each other and having one end portion disposed in opposition to one end portion of said lower magnetic member so as to define a magnetic gap therebetween and the other end portion brought into contact with the other end portion of said lower magnetic member so as to form a magnetic circuit in cooperation with said lower magnetic member;

(c) a coil conductor film constituting a coil of a predetermined number of turns having a portion extending between said lower magnetic member and said upper magnetic member so as to intersect said magnetic circuit;

(d) a first electrically insulating layer interposed between said lower magnetic member and said coil conductor film;

(e) a second electrically insulating layer interposed between said upper magnetic member and said coil conductor film and formed of a photo-sensitive resin; and

(f) a gap member disposed in said magnetic gap.

4,516,181

TAPE CASSETTE LINER SHEET ARRANGEMENT

Hideo Shirako, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,279

Claims priority, application Japan, Sep. 9, 1981, 56-134073[U]

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 300—132 **8 Claims**

1. A tape cassette, comprising:

a pair of cassette halves each having a pair of reel shaft insertion holes and coupled with each other to form a housing, each said cassette half having a plurality of projections protruding toward the other cassette half from that surface thereof which faces the other cassette half;

a pair of reel hubs arranged for rotation in the region of the reel shaft insertion holes in the cassette halves;

a magnetic tape housed in the cassette halves and wound around the reel hubs; and

a pair of liner sheets, one of which is arranged between one of the cassette halves and the magnetic tape and the other of which is arranged between the other cassette half and the magnetic tape, each of said sheets having a plurality of hollow protrusions which protrude toward the associated cassette half and elastically abut the projections of the cassette half, so that the magnetic tape as wound on said reel hubs is supported elastically on both sides by substantial surface portions of said liner sheets at the central portion of said housing along the direction of the thickness of said housing, wherein the magnetic tape is prevented from being wound irregularly.

4,516,182

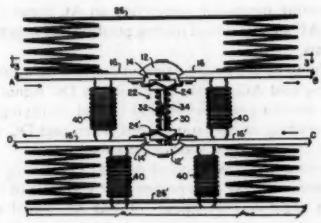
CURRENT LIMITING APPARATUS

LeRoy H. Franklin, Escondido, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 225,627, Jan. 16, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 424,839

Int. Cl.³ H02H *7/22*

U.S. Cl. 361—13 **4 Claims**



1. A current limiting apparatus comprising:

bridging electrical contact means for forming a first current path across a gap in a conductor;

means for breaking said first current path in response to the current in said conductor exceeding a predetermined value, said breaking means comprising:

(i) means for retaining said bridging electrical contact means against said conductor in opposition to mechanical forces applied to said bridging electrical contact means, including connecting means connecting said bridging electrical contact means to a fixed point with respect to said conductor; and

(ii) means for releasing said retaining means in response to current in said conductor exceeding a predetermined value, said mechanical forces causing in response thereto said bridging electrical contact means to break away from said conductor, said means for releasing said retaining means comprising a fusible wire means operatively attached to said connecting means such that when said fusible wire means is burned off, said connecting means separates from said fixed point, thereby enabling said

bridging electrical contact means to break away from said conductor;

fast-acting fuse means connected to said conductor in parallel with said bridging electrical contact means, operative to maintain current in a second current path for a predetermined length of time after said first current path formed by said bridging electrical contact means is broken, such that said bridging electrical contact means has sufficient time to physically move away from said conductor to suppress arcing across said gap; and

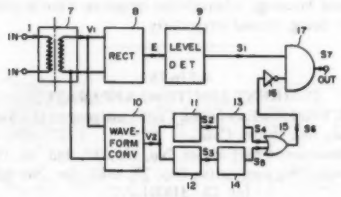
current limiting conductive means connected to said conductor in parallel with said bridging electrical contact means for providing a higher impedance third current path across said gap after said second current path formed by said fuse means is broken.

4,516,183

OVERCURRENT RELAY

Tadashi Matsuzaki, and Koji Sumi, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaishi, Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,603
Claims priority, application Japan, Dec. 2, 1981, 56-196156
Int. Cl.³ H02H *7/26*
U.S. Cl. 361—71 **12 Claims**



1. An overcurrent relay, comprising:

converting means for converting an AC input current into an AC signal voltage having positive and negative components,

rectifying means coupled to said converting means for rectifying said AC signal voltage into a DC signal voltage,

level detecting means coupled to said rectifying means for outputting an operation signal when said DC signal voltage exceeds a predetermined value,

determining means coupled to said converting means for determining the time period of at least one of the positive and negative components of said AC signal voltage for providing a determination signal when said determined time period exceeds a first predetermined time period,

blocking means coupled to said level detecting means and said determining means and responsive to said determination signal for blocking said operation signal from being output.

4,516,184

CIRCUIT DEVICE FOR DRIVING ELECTROMAGNETICALLY MOVABLE UNIT AT HIGH SPEED WITH SINGLE POWER SOURCE

Noboru Tominari, No. 19-9, Kamiyama-cho, Shibuya-Ku, Tokyo, Japan, assignor to Noboru Tominari and Mikuni Kohyo Co., Inc., both of, Japan

Filed Dec. 29, 1981, Ser. No. 335,578
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—152 **2 Claims**

1. A circuit device for driving an electromagnetically movable unit at a high speed with a single power source comprising:

positive and negative input lines,

first and third transistors, one being connected at an emitter thereof to said positive input line and another being connected at an emitter thereof to said negative input line,

second and fourth transistors, one being connected at an emitter thereof to said positive input line and another being connected at an emitter thereof to said negative input line,

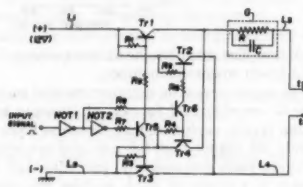
a control signal input line,

a fifth transistor connected at the collector thereof to the base of said first transistor and at the emitter therof to the base of said third transistor,

a sixth transistor connected at the collector thereof to the base of said second transistor and at the emitter thereof to the base of said fourth transistor,

a first NOT element connected at the input thereof to said control signal input line and at the output thereof to the base of said sixth transistor for inverting the input control signal applied thereto,

a second NOT element connected at the input thereof to the



output of said first NOT element and at the output thereof to the base of said fifth transistor for inverting the output from said first NOT element,

a first output line connected at one end to the collector of said first transistor and the collector of said fourth transistor,

a second output line connected at one end to the collector of said third transistor and the collector of said second transistor,

a first output terminal connected to the other end of said first output line,

a second output terminal connected to the other end of said second output line, and

an instantaneous double voltage generating means connected in series with said output line circuit and having a resistor and a capacitor connected in parallel with the resistor for inverting and doubling the voltage between the output lines when said input signal is inverted in polarity.

4,516,185

TIME RATIO CONTROL CIRCUIT FOR CONTACTOR OR THE LIKE

John C. Culligan, Kenner, La.; Frederick A. Stich, Milwaukee, Wis., and Conrad F. Williams, New Orleans, La., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 30, 1983, Ser. No. 537,705
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—154 **16 Claims**

1. In an electromagnetic contactor including contacts for making an electric circuit, at least one of said contacts being movable, armature means coupled to said movable contact, and an electromagnetic coil for effecting movement of said armature means, means for causing current of a first, higher value to flow through said coil in order to cause said movable contact to complete a circuit and to cause current of a second, lower value to flow through said coil after said movable contact has completed the circuit, comprising:

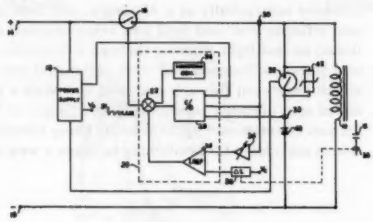
a first solid state electronic switch in series circuit relationship with said coil;

oscillator means for outputting a signal;

means coupling said oscillator means to said first switch for

operating said first switch in response to the oscillator signal;

means for causng said oscillator means to enable said first switch at a first, higher time ratio to provide said coil with a first, higher current flow for a period sufficient to allow



the contacts to operate, and for causing said oscillator means to enable said first switch at a second, lower time ratio to provide said coil with a second, lower current flow after said period, said second current flow being sufficient to maintain said contacts in an operated position.

4,516,186

MULTI-LAYER POWER CAPACITOR

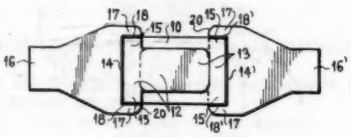
Patrick Hardy, Auxonne; Michel Cantagrel, Ruffey-Les-Echirey, and Serge Guichard, Genlis, all of France, assignors to LCC.CICE-Compagnie Europeenne de Composants Electroniques, Paris, France

Filed Nov. 28, 1983, Ser. No. 555,621

Claims priority, application France, Nov. 26, 1982, 82 19926

Int. Cl.³ H01G *1/14, 4/10;* **H05K** *7/02*

U.S. Cl. 361—306 **7 Claims**



1. A multi-layered power capacitor comprising:

internal electrodes extending over a part of at least each of said layers;

connecting means for connecting said internal electrodes electrically and thermally in an alternate manner to junction edges of said capacitor;

a plurality of terminal means extending over a junction edge of said capacitor for providing an electrical surface for electrical contact to be made wherein said terminal means are single piece metalic members having a continuous surface adapted to extend an entire junction edge and at least on surface extending in part over at least one lateral edge and wherein said terminal means provides electrical and thermal conduction.

4,516,187

OUTER WRAPPING AND PLANAR TERMINATIONS FOR A METALLIZED WOUND CAPACITOR AND METHOD THEREFOR

Bernard Lavene, Ocean, N.J., assignor to Electronic Concepts, Inc., Eatontown, N.J.

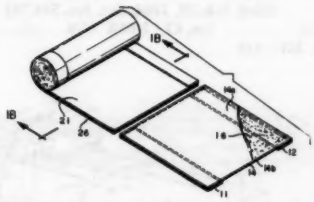
Filed Jul. 13, 1983, Ser. No. 513,271

Int. Cl.³ H01G *4/18, 1/14*

U.S. Cl. 361—309 **10 Claims**

1. A metallized wound capacitor comprising:

first and second elongated dielectric webs each having at least one electrode formed on at least one face thereof, the dielectric webs being convolutely arranged in a capacitor roll with the electrodes in superposed relation to each other; and



a third dielectric web wound about the capacitor roll to form a protective wrap, the third web having a first and a second metallic band terminal formed on the side of the third web remote from the capacitor roll and each band terminal disposed adjacent a respective end of the roll.

4,516,188

LOGIC CARD

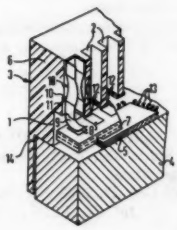
Claus Kessler, Berg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,371

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236325

Int. Cl.³ H01R *9/00*

U.S. Cl. 361—408 **15 Claims**



1. A logic card and an electrical connector, in combination comprising:

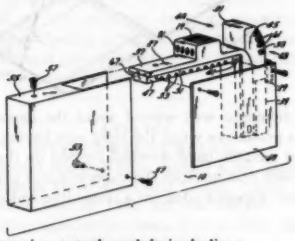
a logic card comprising a printed circuitboard including first and second surfaces, said first surface including contact pads, said second surface adapted for contact to at least one micromodule, and conductors within said logic card extending between said pads and said second surface; and

an electrical connector comprising a connector body, surfaces defining first and second recesses in said body, passage means defining a plurality of passages through said body in communication between said first recess and the exterior of said body, a plurality of contacts each in a respective one of said passages and each including a resilient section, said printed circuitboard disposed in said first recess with said pads aligned with said passages and bearing against respective resilient sections of said contacts, and pressure means in said second recess for contacting the micromodule on said second surface of said printed circuitboard and urging said contact pads against said resilient sections.

4,516,189
CONTROL APPARATUS HAVING MODULAR CONSTRUCTION

Charles E. Seaks, Jr., Greenfield, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Feb. 29, 1984, Ser. No. 584,752
Int. Cl.³ H05K 7/16
U.S. Cl. 361—426 **11 Claims**



1. An electronic control module including:

a module frame swingably mounted to a rail member and including first, second and third electrical connection means, said module frame further including a latching lip engaging a first edge of a rail member and a resilient clip engaging a second edge of said rail member, said lip, said clip and said edges cooperating and forming means to permit said module to be swingably mounted to and removed from said rail member while avoiding movement of a module mounted adjacent thereto;

said first connection means including a plurality of bus conductors constructed and arranged to engage the bus conductors of adjacent modules when swingably mounting said frame;

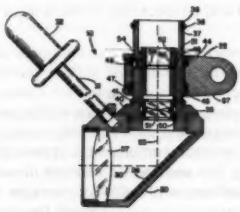
said second connection means including a plurality of electrically conductive pads for engaging a circuit board attachable to said frame;

said third connection means including a plurality of terminals adapted for the connective termination of external wiring.

4,516,190
SURGICAL HEADLAMP

Jacobus Kloots, Sturbridge, Mass., assignor to Luxtec Corporation, Sturbridge, Mass.

Filed Dec. 29, 1983, Ser. No. 566,530
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 **10 Claims**



1. A surgical headlamp for use between the eyes comprising:

(a) a headband;

(b) an annular clamp supported from said headband;

(c) a cylindrical upper housing slideably mounted in said clamp;

(d) a condenser lens assembly in said upper housing;

(e) a sleeve secured in said housing clamping said lens assembly in place;

(f) a detent in said sleeve for securing a fiberoptic cable connector in position facing said lens assembly;

(g) a lower housing secured to said upper housing;

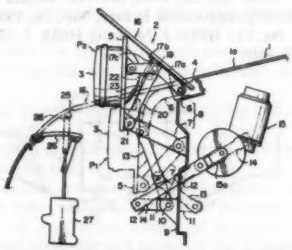
(h) a reflector mounted in said lower housing facing said lens assembly substantially at a 45° angle; and,

(i) a field lens mounted in said lower housing facing said reflector substantially at a 45° angle, said lens assembly, said reflector and said field lens being selected and positioned so that light entering through a fiberoptic cable at said sleeve is focussed and then collimated into a beam which passes out through said field lens with a predetermined spot diameter substantially at an angle of 90° from the axis of entry, said upper housing being slideably movable in said clamp for positioning between a wearer's eyes.

4,516,191
RETRACTABLE HEAD-LIGHT DEVICE FOR AUTOMOBILES

Naomune Moriyama, and Fumiyuki Ohtani, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 12, 1984, Ser. No. 599,342
Claims priority, application Japan, Apr. 15, 1983, 58-67612
Int. Cl.³ B60Q 1/06
U.S. Cl. 362—65 **14 Claims**

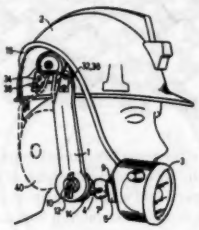


1. A retractable head-light device for automobiles comprising head lamp means mounted on an automobile body for movement between an extended position wherein the head lamp means is projected through opening means in the automobile body and directed substantially forwards and a retracted position wherein the head lamp means is retracted within the body, head lamp cover means having a rear end portion mounted on the body for vertical swingable movements between an extended position wherein the lamp cover means uncovers said opening means in the body and a retracted position wherein the lamp cover means closes said opening means to provide a substantially flush body surface, lamp driving means for driving said head lamp means between said extended and retracted positions of the head lamp means, cover driving means for driving said lamp cover means between said extended and retracted positions in response to movements of the head lamp means, said cover driving means including a pair of cover driving links disposed at the opposite sides of the lamp cover means, each of said cover driving links having one end connected with said lamp cover means and the other end with said lamp driving means so that the lamp cover means is driven together with the head lamp means, cover hinge means for pivoting the lamp cover means, said cover hinge means twisting when the lamp cover means is driven from the retracted position to the extended position to thereby maintain a front edge of the lamp cover means substantially horizontally.

4,516,192
LAMP CARRIAGE ARM FOR SAFETY HATS

Rolf W. Bolwig, Sudbury, Canada, assignor to Rotabo Industries Inc., Cooper Cliff, Canada

Filed Jan. 11, 1984, Ser. No. 569,849
Int. Cl.[3] F21L *15/14*
U.S. Cl. 362—107 21 Claims

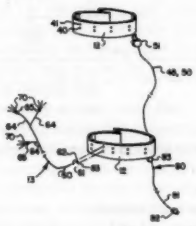


15. A miner's safety hat, comprising a safety hat, a lamp carriage arm attached at one end to one side of said safety hat and extending downwardly in spaced relationship to the safety hat wearer's head, and a lamp attached to the other end of the lamp carriage arm, the length of said lamp carriage arm being such that the lamp is positioned roughly in the area of above and in front of the safety hat wearer's collarbone.

4,516,193
LIGHTING SYSTEM FOR ARTIFICIAL CHRISTMAS TREE

James P. Murphy, 211 Executive Office Park, 4500 W. Illinois Ave., Midland, Tex. 79703

Filed Apr. 16, 1984, Ser. No. 600,947
Int. Cl.[3] F21P *1/02*
U.S. Cl. 362—123 6 Claims

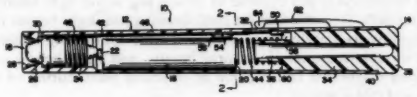


1. An electrical lighting system for a tree comprising: flexible electrical distribution strap means having opposite end means for mounting said strap means around a tree trunk and a plurality of spaced electrical connection means for male electrical plugs; electrical connection means for connecting said distribution strap means to a source of electrical power; and limb branch electrical circuit means for mounting on a tree limb and having male plug means on one end for connection with said distribution strap means and light means connected along said electrical circuit means including a socket for a light bulb.

4,516,194
PEN LIGHT

David L. Johns, Clearwater, Fla., assignor to Suncoast Medical Manufacturing Co., Clearwater, Fla.

Filed Jun. 11, 1984, Ser. No. 619,622
Int. Cl.[3] F21L *7/00*
U.S. Cl. 362—202 18 Claims

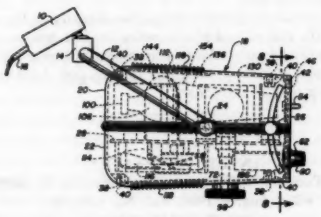


1. A pen light comprising a hollow housing having a retainer member secured to the rear portion thereof to house a voltage source in operative engagement with a light source, a first conductor member movable between a first and second position and a second conductor member each disposed within said hollow housing to operatively engage said light source and said voltage source respectively and an actuator clip attached to said hollow housing adjacent an actuator clip aperture formed on said hollow housing, said first conductor member comprising an elongated conductor strip including a first contact element to operatively engage said light source and a second contact element disposed to selectively engage said second conductor member when said first conductor member is in said second position, said hollow housing further includes a longitudinally disposed groove formed on the inner surface thereof corresponding to said elongated conductor strip to receive said elongated conductor strip therein to align said elongated conductor strip longitudinally relative to said actuator clip aperture and said actuator clip, said actuator clip being movable between a first and second position to selectively engage said first conductor member such that when said actuator clip is in said first position said first conductor member is separated from said second conductor member to form an open circuit and when said actuator clip is in said second position said actuator clip engages said first conductor member to move said first conductor member from said first position to said second position whereby said first conductor member engages said second conductor member to close the circuit and actuate said light source.

4,516,195
MULTI-FUNCTION DENTAL OPERATING LIGHT SOURCE

Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

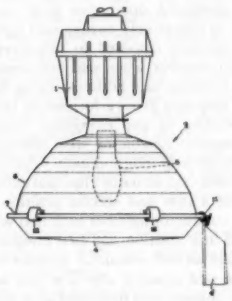
Filed Dec. 28, 1983, Ser. No. 566,235
Int. Cl.[3] F21V *9/08*
U.S. Cl. 362—281 25 Claims



1. A multi-functional dental operative light having at least two optical filters supported upon means movably adapted selectively to position one of said filters relative to a stationary light source having a parabolic reflector adapted to columnate light beams therefrom, beam splitting reflectors also mounted

upon said means and positioned in the beam path from said light source and arranged to direct diverging light beams respectively to reflecting mirrors fixed to said means in spaced relationship and angled toward each other and operable to direct separate light beams in converging directions toward a dental target to be illuminated at a specified distance from said means by substantially preserving columnation of the light source in accordance with said selected optical filter, said filters of which at least two are included in the multi-functional light respectively are capable of producing white light beams substantially free of color for oral illumination, light beams in the yellow to orange range incapable of polymerizing visible light-curable material in an oral cavity, and light beams of reduced brightness and capable of effecting photocuring of a light-curable material.

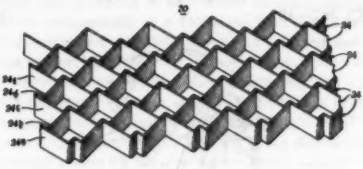
4,516,196
LUMINAIRE HINGE AND LATCH
Walter R. Blake, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.
Filed Jul. 18, 1983, Ser. No. 514,736
Int. Cl.³ F21V *3/00*
U.S. Cl. 362—311 **6 Claims**



1. A separable latch arrangement in a luminaire comprising:
an upper housing assembly for a light source, said assembly having a rim with a radially projecting flange portion,
a plastic refractor adapted to close the underside of the housing assembly, said refractor having a rim portion overhung by and adapted to mate with said projecting flange portion of the rim of said assembly,
a plurality of latches disposed around the periphery of said refractor and dimensioned to span both rim portions for direct clamping action thereon, said latches being proportioned to press against the upper surface of said projecting flange portion and substantially perpendicularly against the lower surface of said plastic refractor rim portion over a substantial area whereby to avoid creating any high stress therein, and
retaining means attaching said latches directly to the underside of the rim of said plastic refractor in a manner allowing them to be pivoted into clamping position astride both rims, said means preventing disengaged latches from dropping off the refractor.

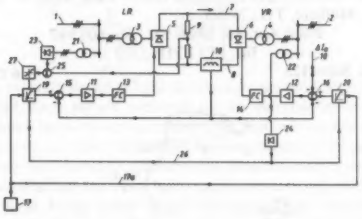
4,516,197
ANTIGLARE PANEL
Edward H. Yonkers, 905 Westerfield, Wilmette, Ill. 60091
Filed Aug. 9, 1984, Ser. No. 639,208
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—342 **5 Claims**

1. A cellular antiglare panel comprising a plurality of identical interlocked strips, each strip being formed of a series of "W" shapes having two connected short legs formed at right angles to each other defining a recessed right angle and two long legs each extending at right angles from a respective short leg to define the "W" shapes, the long legs of adjacent "W" shapes being formed at right angles with each other to define a projecting right angle, the exterior surface of the projecting



right angles of one strip being positioned within and against the interior surface of the recessed right angles of an adjacent strip, so that the short legs of said adjacent strip overlie the long legs of said one strip to provide contacting surfaces.

4,516,198
CONTROL SYSTEM FOR DC POWER TRANSMISSION
Göte Liss, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden
Filed Feb. 22, 1983, Ser. No. 468,606
Claims priority, application Sweden, Mar. 4, 1982, 8201341
Int. Cl.³ H02J *3/36*
U.S. Cl. 363—35 **6 Claims**

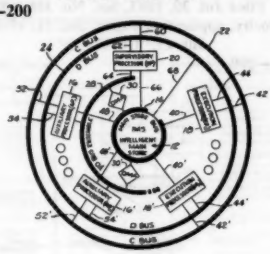


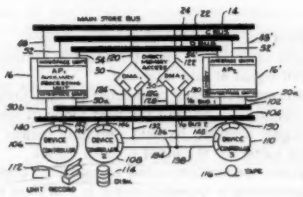
1. A DC power transmission system comprising
a rectifier station,
an inverter station,
an AC network for each station,
a DC line connecting said stations together,
control means for the system comprising a current control circuit for the transmission system which delivers a common current order to a current regulator for each station, and
a circuit in one of said stations for setting a current margin between the said two stations,
characterized in that
the control means comprises a device for sensing the voltage in the AC network of the inverter station and that
a current limiting circuit is provided in each said station for simultaneous limitation of the current order in both said stations in dependence on a reduction of the voltage in the AC network of the inverter station.

4,516,199
DATA PROCESSING SYSTEM

Gideon Frieder, Williamsville; David T. Hughes, Amherst; Mark H. Kline; John T. Liebel, Jr., both of Williamsville; David P. Meier, Orchard Park, and Edward A. Wolff, Tonawanda, all of N.Y., assignors to Nanodata Computer Corporation, Buffalo, N.Y.

Division of Ser. No. 83,677, Oct. 11, 1979,. This application Dec. 5, 1980, Ser. No. 213,380
Int. Cl.³ G06F 9/00
U.S. Cl. 364—200 10 Claims





1. An input-output arrangement for a data processing system including a main store and at least one device controller, said arrangement comprising:

(a) at least one input-output bus connected to said device controller;

(b) a processor for controlling said input-output bus;

(c) first connecting means separate from said input-output bus for connecting said processor to said main store;

(d) second connecting means for connecting said processor to said input-output bus;

(e) a direct memory access controller;

(f) third connecting means for connecting said direct memory access controller to said main store;

(g) fourth connecting means for connecting said direct memory access controller to said input-output bus; and

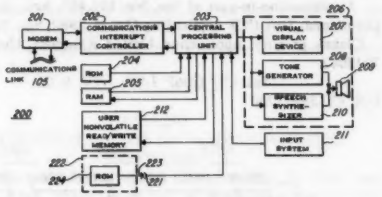
(h) fifth connecting means separate from said input-output bus for connecting said direct memory access controller to said device controller;

(i) said first, second and fourth connecting means enabling said processor to initiate transfer of information through said direct memory access controller while itself simultaneously participating in information transfer and maintaining control over said direct memory access controller, said first, second, third, fourth and fifth connecting means allowing parallel transfers of information between said processor and said main store, between said direct memory access controller and said main store, between said processor and said device controller and between said direct memory access controller and said device controller.

4,516,200
DATA COMMUNICATIONS SYSTEM WITH HOST CHARACTER TERMINAL MODE

E. Earle Thompson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 18, 1981, Ser. No. 264,905
Int. Cl.³ H04J 6/00
U.S. Cl. 364—200 19 Claims



1. A data communication system comprising:

a host data processing system having a condition data signal generating means for generating a set of a plurality of condition data signals each having a corresponding condition name signal, a condition name signal generating means for generating a sequence of condition name signals and for generating a repeat signal, a data transmission means for transmitting data, and a mode selection means connected to said data transmission means for entering a condition data transmission mode thereupon causing said data transmission means to transmit a condition data transmission mode signal and thereafter to transmit said set of condition data signals, and for entering a condition name transmission mode and thereupon causing said data transmission means to transmit a condition name transmission mode signal and thereafter to transmit said sequence of condition name signals and said repeat signal;

a data communication means connected to said data transmission means of said host data processing system for communication of said data transmitted by said data transmission means; and

a remote data processing system having a receiving means connected to said data communication means for receiving data from said host data processing system, a memory means having a plurality of memory locations for storing data, a memory access means for recalling data from selected memory locations of said memory means, mode determination means connected to said receiving means for entering a condition data transmission mode upon receipt of a condition data transmission mode signal whereupon the next received condition data signals are stored in memory locations of said memory means and for entering a condition name transmission mode upon receipt of a condition name transmission mode signal whereupon said memory access means recalls condition data signals from memory location is of said memory means corresponding to the next received condition name signals, an output means for generating an operator perceivable indication corresponding to said recalled condition data signals, a condition name signal storage means connected to said memory access means for storing received condition name signals therein, and a repeat means connected to said receiving means and said condition name signal storage means for initiating recall of said condition name signals stored therein for application to said memory access means to recall condition data signals from said memory means corresponding to said condition name signals recalled from said condition name signal storage means upon reception of said repeat signal, whereby said output means repeats said operator perceivable indication corresponding to said condition name signals stored in said condition name signal storage means.

4,516,201

MULTIPLEXED DATA COMMUNICATIONS USING A QUEUE IN A CONTROLLER

Robert G. Warren, Glasgow, and Michael A. Robertson, Stirling, both of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

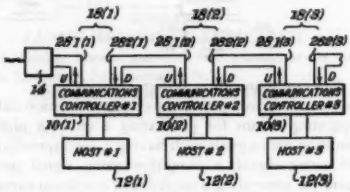
PCT No. PCT/GB80/00161, § 371 Date May 28, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/01064, PCT Pub. Date Apr. 16, 1981

Continuation-in-part of Ser. No. 191,467, Sep. 26, 1980, abandoned. This PCT application Oct. 9, 1980, Ser. No. 269,058

Claims priority, application United Kingdom, Oct. 9, 1979, 7935042

Int. Cl.³ G06F *1/00, 5/04, 9/06*

U.S. Cl. 364—200 **19 Claims**



1. A communications controller for receiving and processing data from a data processor for use by a data link and for receiving and processing data from said link for use by said processor, said controller comprising;

a bus for receiving from said processor a mixed succession of data characters for transmission by said data link and command characters not for transmission by said data link, said command characters including a mixture of direct command characters for immediate, pre-emptive response thereto by said controller and queued command characters for response thereto by said controller subsequently to obeying the previously-received queued command character or to transmitting the previously received data character,

a queue, coupled to receive said characters on said bus, operable to be advanced to store the character present on said bus or to deliver up a previously stored character, stored characters being delivered up in the same serial order as that of their receipt, coupled to receive a first indication, from said processor, that said character on said bus is a queued command character and operable to respond thereto to store a flag in association therewith,

a gate, coupled to receive said delivered-up characters from said queue and operable in response to the receipt of said flag to separate out said queued command characters, and

a multiplexer, coupled to receive, from said processor, said first indication, a second indication that the character on said bus is a direct command character and third indication that the character on said bus is a data character, coupled to respond to said flag, delivered up by said queue, coupled to receive a first, fast clock signal, coupled to receive a second clock signal whose rate is sympathetic to the rate of data transmission by said link, and operable to supply a queue clock signal for controlling the advancing of said queue, where

when in receipt of said first indication, said multiplexer provides no queue clock signal, when in receipt of said second or said third indications said multiplexer provides said first, fast clock signal as said queue clock signal for the loading of the characters on said bus into said queue, when in receipt of said flag said multiplexer provides said first, fast clock signal as the queue clock signal for the rapid delivering up of a queued command from said queue, and when in receipt of none of said first, second or third indications nor of said flag said multiplexer provides said second clock signal as said queue clock signal for the delivering up of data characters for transmission by said link.

4,516,202

INTERFACE CONTROL SYSTEM FOR HIGH SPEED PROCESSING BASED ON COMPARISON OF SAMPLED DATA VALUES TO EXPECTED VALUES

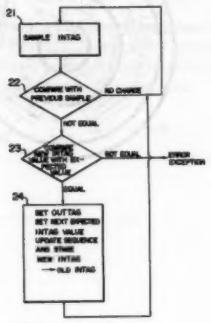
Yoshihiko Kadowaki, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,498

Claims priority, application Japan, Jul. 31, 1980, 55-105241

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—200 **19 Claims**



1. An interface control system comprising:

(a) means coupled to an interface for sampling an input control signal at said interface;

(b) first compare means connected to said sampling means for comparing a current sampled value of said input control signal sampled by said sampling means with an expected value for the input control signal;

(c) response means connected to said first compare means for generating a response signal in response to said input control signal and a next expected value signal representing the expected value of the next input control signal in accordance with a predetermined interface operation specification when said first compare means indicates an equality between the current sampled value and the expected value; and

(d) means connected to said sampling means for storing a sampled value to provide a previously sampled value signal, second compare means connected to said sampling means and said storing means for comparing the current sampled value of said input control signal with said previously sampled value signal, and means connected to said first and second compare means for generating an abnormal condition signal when both of said first and second compare means indicate compare unequal conditions.

4,516,203

IMPROVED APPARATUS FOR ENCACHING DATA WHOSE VALUE DOES NOT CHANGE DURING EXECUTION OF AN INSTRUCTION SEQUENCE

David A. Farber, Jamaica Plain, Mass.; Brett Bachman, Shaker Heights, Ohio; John F. Pilat, Raleigh, N.C., and Walter A. Wallach, Jr., San Jose, Calif., assignors to Data General Corporation, Westboro, Mass.

Filed Sep. 11, 1981, Ser. No. 302,000

Int. Cl.³ G06F *9/30*

U.S. Cl. 364—200 **21 Claims**

1. In an improved digital computer system including

(A) memory means for performing memory operations including storing and providing items of data including instructions in response to memory commands, each one of said memory commands specifying one said memory

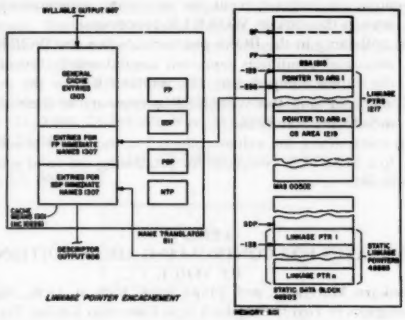
operation and an address of one of said items of data in said memory means and

(B) processor means connected to said memory means for processing said items and providing said memory commands in response to said instructions, and wherein

said instructions are contained in instruction sequences of said items and

said items include operands associated with said instruction sequences and representing said items processed by said processor means while executing said instruction sequences,

encachement means comprising:



LINKAGE POINTER ENCACHEMENT

(2) an encacheable item of said items associated with an execution of one of said instruction sequences by said processor means, said encacheable item having a value which remains unchanged throughout said execution;

(2) a code specifying said encacheable item contained in certain said operands;

(3) cache means in said processor means for storing said encacheable item and outputting said encacheable item in response to said operands containing said code; and

(4) cache loading means for loading said encacheable item into said cache means.

4,516,204

OPTICAL PASSIVE BUS CONTROL SYSTEM

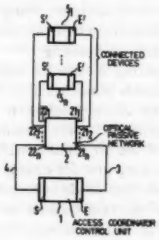
Anton Sauer, and Hans Thinschmidt, both of Germering, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 27, 1982, Ser. No. 382,666

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123448

Int. Cl.³ G06F *3/04, 15/16;* **G02B** *5/14*

U.S. Cl. 364—200 **15 Claims**



1. A bus control arrangement for controlling the access to an optical passive bus by a plurality of connected devices which are connected to said bus, comprising an access coordinator control means, said access coordinator control means having a light signal receiver unit and a light signal transmitter unit, first connecting means connecting said access coordinator control means with said bus over a first light signal transmission line, whereby outputs of said connected devices are connected to said light signal receiver unit, second connecting means connecting said access coordinator control means with said bus over a second light signal transmission line, whereby the output of said light signal transmitter is connected to the light signal inputs of said connected devices, said first and second connecting means comprising light wave guides having the shortest possible length, said access coordinator control means having means responsive to specific operating conditions on said passive bus for selectively selecting an asynchronous of a synchronous operating mode for access to the bus by said connected devices.

4,516,205

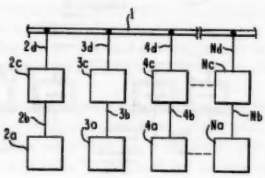
ACCESS CONTROL OF DATA TRANSMISSION NETWORK

Hubert I. Eing A., J. B. Pastene 3111, Santiago 10, Chile, and Rolf D. Klein, Strassberger Str. 34, 8000 Munchen 40, Fed. Rep. of Germany

Filed Nov. 9, 1982, Ser. No. 440,373

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **9 Claims**



1. In a system for transmission of message blocks from one of a plurality of data stations, each data station having a unique address, through one of a like plurality of communication units, each communication unit uniquely associated with one of the data stations, over a data bus, through another of the plurality of communication units, to another of the plurality of data stations, the improvement in which each communication unit comprises:

first means communicating with the associated data station for permitting transmission of message blocks between said communication unit and the data station;

second means coupling the communication unit to the data bus for permitting transmission of message blocks, synchronization signals, and control signals between the communication unit and the data bus;

third means, responsive to receipt by said second means of a synchronization signal at the time a message block is available at said first means for transmission by the communication unit by way of said second means to the data bus, for transmitting the logical ones of an unique encoded representation of the address of the associated data station to said second means for transmission to the data bus, said logical ones being transmitted to the data bus in sequence during respective bit intervals associated with such logical ones;

fourth means for monitoring the data bus for logical ones generated by any other of said plurality of communication units during respective bit intervals associated with the logical zeros of the unique encoded representation;

fifth means, responsive to monitoring of a logical one signal on the data bus by said fourth means, for terminating transmission of the logical ones of the encoded representation until receipt of the next synchronization signal by said second means; and

sixth means, responsive to the transmission of all of the logical ones of the complete encoded representation to the data bus without the monitoring of a logical one signal by said fourth

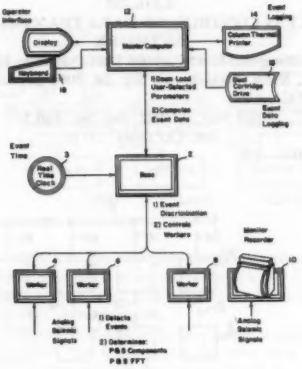
means and the accompanying termination of transmission of the encoded representation by said fifth means in response to the monitoring of a logical one by said fourth means, for initiating transmission from the communication unit to the data bus of a signal including the message block, a portion of said signal constituting a synchronization signal.

4,516,206

POST-PROCESSING OF SEISMIC PARAMETER DATA BASED ON VALID SEISMIC EVENT DETERMINATION

Thomas V. McEvilly, 733 Alvarado Rd., Berkeley, Calif. 94705

Filed Oct. 21, 1982, Ser. No. 435,596
Int. Cl.³ G01V *1/30*
U.S. Cl. 364—421 **4 Claims**



1. A method for detecting a valid seismic event, which comprises the steps of

(a) continuously monitoring in dedicated WORKER PROCESSORS each of a plurality of physically separated stations a seismic signal (X) corresponding with the ambient seismic background level, including the steps of

(1) digitizing the seismic signal and removing the mean therefrom to produce a first time series ($X(t_i)$);

(2) computing from the first time series a new time series in accordance with the formula:

$$X'(t_i) = \frac{\sum_{j=i-n}^{i} |X(t_j)|}{\quad};$$

(3) forming long-term (LTA) and short-term (STA) averages of the new time series ($X'(t_i)$); and

(4) producing a first abnormal-condition trigger signal when the ratio of short term average to long term average exceeds a first given value (C_1);

(b) determining, in response to said trigger signal, the first time of onset (PT) of the first abnormal condition;

(c) processing a primary segment (P) of said first time series($X(t_i)$) beginning at the onset time (PT) to determine amplitude (PA), quality (PQ), and polarity (PP) values, said primary segment being subsequently Fourier transformed to produce primary arrival spectral estimates of low-frequency level, corner-frequency value, and high-frequency slope;

(d) producing a second abnormal-condition trigger signal when the ratio of short term average (STA) to the P-amplitude (PA) exceeds a second given value (C_2);

(e) determining, in response to said second trigger signal, the second time of onset (ST) of the second abnormal condition;

(f) processing a secondary segment (S) of said first time series ($X(t_i)$) beginning at the second onset time (ST) to determine amplitude (SA) and quality (SQ) values, said secondary segment being subsequently Fourier transformed to produce secondary arrival spectral estimates of low-frequency level, corner-frequency value, and high-frequency slope;

(g) monitoring in a BOSS processor (2) the status of the dedicated WORKER processors to determine, upon the occurrence of a first abnormal-condition trigger signal in any one thereof, whether or not the first abnormal condition indicates a valid seismic event, including the step of determining whether a sufficient number of onset times (PT) are received during a given time window (TW);

(h) aborting, when the WORKER abnormal conditions are not a valid seismic event, the processing sequences underway in the various WORKER processors;

(i) collecting in the BOSS processor, when the WORKER abnormal conditions represent a valid seismic event, all the values computed by the WORKERS for the event, and returning the WORKER processors to their initial monitoring status; and

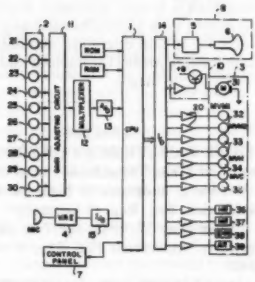
(j) transmitting the values collected in the BOSS processor to a MASTER computer for processing the valid seismic event.

4,516,207

APPARATUS FOR CONTROLLING AIR CONDITIONER BY VOICE

Masakazu Moriyama, and Takao Saito, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 24, 1982, Ser. No. 352,022
Claims priority, application Japan, Mar. 9, 1981, 56-33472
Int. Cl.³ G05D *23/00*; B60H *3/00*; G06F *15/20*
U.S. Cl. 364—424 **6 Claims**



4. Apparatus for controlling an air conditioner by voice commands, said air conditioner being controlled under a plurality of modes including a fresh air mode and a recirculated air mode, the apparatus comprising:

a voice recognizing means for recognizing predetermined voice commands announced by an operator to provide output signals corresponding to said voice commands, said predetermined voice commands corresponding to said modes of the air conditioner, respectively;

a central processing unit for changing the fresh air mode to the recirculated air mode in response to said output signal indicative of the recirculated air mode, for holding the recirculated air mode during a first predetermined period of time after the fresh air mode is changed to the recirculated mode, for changing the recirculated mode to the fresh-recirculated air mixture mode when the first predetermined period of time has elapsed, for

holding the fresh-recirculated air mixture mode during a second predetermined period of time after the recirculated air mode is changed to the fresh-recirculated air mixture mode, and for changing the fresh-recirculated air mixture

mode to the fresh air mode when the second predetermined period of time is elapsed.

4,516,208

LABEL ISSUING APPARATUS WITH PROGRAMMABLE LABEL FEED

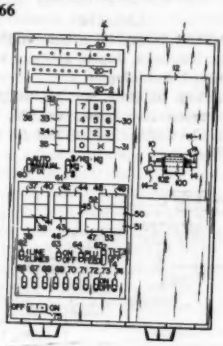
Yasuhiro Sakura, Mishima, Japan; Yasushi Nakajima, Richmond, England; Noriyasu Tajima, Mishima, and Hitoshi Nimura, Shizuoka, both of Japan, assignors to Tokyo Electric Co. Ltd., Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,395

Claims priority, application Japan, Nov. 21, 1980, 55-164248; Nov. 21, 1980, 55-164249; Nov. 21, 1980, 55-164250; Nov. 21, 1980, 55-164251

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—466 **10 Claims**



1. A label issuing apparatus comprising:

label feed means for feeding labels adhered on a label carrier;

separator means for peeling said label off said label carrier,

label detecting means disposed in the vicintity of said separator means for detecting that portion of said label which is peeled of said label carrier by said separator means;

printing means for printing said label;

data storing means having first and second memory areas for respectively storing first and second feed distance data;

keyboard means having a plurality of keys selectively operative to write first and second feed distance data into said first and second memory areas said keyboard means including a first key, a second key and a plurality of numeral entry keys, and wherein said first feed distance data is produced and written into said first memory area by operating said first and numeral entry keys, and said second feed distance data is produced and written into said second memory area by subsequently operating said second and numeral entry keys; and

data processing means for controlling said label feed means to feed said label carrier through a first distance defined by the first feed distance data stored in said first memory area after said label detecting means has detected a peeled-off front edge of said label and to set at least one of said labels in a first printing position, and after the label is printed in the first printing position, to feed said label carrier through a second distance defined by the second feed distance data stored in said second memory area from the first printing position.

4,516,209

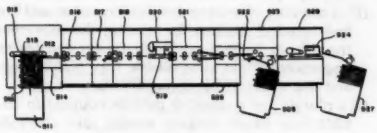
POSTAGE METERING SYSTEM HAVING WEIGHT CHECKING CAPABILITY

Albert W. Scribner, Darien, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 9, 1983, Ser. No. 465,131

Int. Cl.³ G06F *15/20*; G01G *23/38*

U.S. Cl. 364—466 **15 Claims**



1. A postage metering system, comprising:

(a) a postage meter subsystem, said meter subsystem further comprising printing means for printing indicia corresponding to a particular postage value selected for an item to be mailed;

(b) weighing means for determining if the weight of said item is within a preselected range, said weighing means being operatively associated with said printing means so that said printing means may print said indicia only if the weight of such item is within said range;

(c) setting means for setting said printing means so that said indicia correspond to a particular selected postage value; and,

(d) determining means, operatively connected to said weighing means, for receiving data from which said particular selected postage value may be determined, and for determining said particular value, and for setting said preselected range as a predetermined function of said particular value.

4,516,210

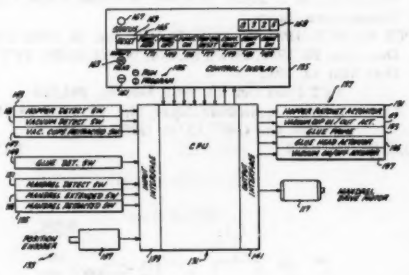
PROGRAMMABLE TRAY FORMING MACHINE

Douglas F. Dahlke, Seattle, Wash., assignor to Marq Packaging Systems, Inc., Yakima, Wash.

Filed Apr. 18, 1983, Ser. No. 485,909

Int. Cl.³ G06F *15/46*; B31B *3/02*

U.S. Cl. 364—471 **16 Claims**



1. A programmable tray forming machine comprising:

(A) conveyor means for receiving tray blanks at a hopper station and moving said tray blanks from said hopper station through a glue station to a mandrel station;

(B) a hopper located at said hopper station for supplying tray blanks to said conveyor means;

(C) controllable tray blank loading means located at said hopper station for moving tray blanks one at a time from said hopper to said conveyor means;

(D) controllable glue means located at said glue station for

selectively applying glue to tray blanks moved through said glue station by said conveyor means;

(E) a forming die located at said mandrel station;

(F) controllable mandrel means located at said mandrel station and aligned with said forming die for pressing tray blanks moved to said mandrel station by said conveyor means into said forming die to form said tray blanks into trays;

(G) a control/display unit for receiving programming information and instructions entered by an operator and displaying operator usable alphanumeric information;

(H) a plurality of sensing devices located at said hopper, glue and mandrel stations for sensing the movement of said tray blanks by said conveyor means and for sensing the operation of said controllable tray blank loading means and said controllable mandrel means;

(I) a plurality of controlled devices coupled to said controllable tray blank loading means, said controllable glue means and said controllable mandrel means; and,

(J) a central processing unit coupled to said control/display unit, said plurality of sensing devices and said plurality of controlled devices for:

(1) receiving and storing said programming information and instructions entered by an operator;

(2) receiving from said plurality of sensing devices information regarding the movement of tray blanks by said conveyor means, the operation of said controllable tray blank loading means and the operation of said controllable mandrel means; and,

(3) controlling said controllable tray blank loading means, said controllable glue means and said controllable mandrel means via said plurality of control devices such that:

(a) tray blanks are moved from said hopper to said conveyor means one-a-time by said controllable tray blank loading means;

(b) said glue means selectively applies glue to said tray blanks as said tray blanks are moved through said glue station by said conveyor means; and,

(c) trays are formed by said mandrel means and said forming dies from said tray blanks are moved to said forming station by said conveyor means.

4,516,211

NUMERICAL CONTROL SYSTEM

Ryoichiro Nozawa, Shibuya; Tsuyoshi Nagamine; Hideaki Kawamura, both of, Hachioji, and Kentaro Fujibayashi, Musashino, all of Japan, assignors to Fujitsu Fanuc Limited, Minamitsuru, Japan

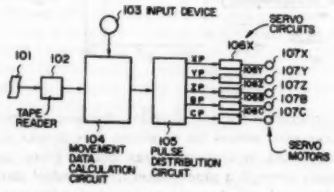
PCT No. PCT/JP81/00296, § 371 Date Jun. 18, 1982, § 102(e) Date Jun. 18, 1982, PCT Pub. No. WO82/01599, PCT Pub. Date May 13, 1982

PCT Filed Oct. 23, 1981, Ser. No. 394,914

Claims priority, application Japan, Oct. 23, 1980, 55-148759

Int. Cl.³ G06F *15/46;* G05B *19/18*

U.S. Cl. 364—474 **5 Claims**



1. A numerical control method for a tool or a table which is rotated in at least one of a vertical and a horizontal direction so as to control the axial direction of the tool relative to a workpiece and where the tool or table is also moved in the directions of X-, Y- and Z-axes to subject the workpiece to desired three-dimensional machining, said numerical control method comprising the steps of:

entering command data which includes a position (X, Y, Z) of a front end of said tool and a vector (I, J, K) of the tool axis direction of said tool via first input means;

entering a tool length (l), measured from a center of rotation of said tool to the front end of said tool, via second input means separate from the first input means;

calculating orthogonal coordinate values (x, y, z) of the center of rotation of said tool and a position (b, c) of a rotational angle of said tool or said workpiece from the command data and the length (l) via a numerical control device; and

executing interpolation computations in accordance with the calculated resultant positional information of the tool so as to move said tool to a commanded position.

4,516,212

CONTROL SYSTEM FOR ROLL GRINDING MACHINE

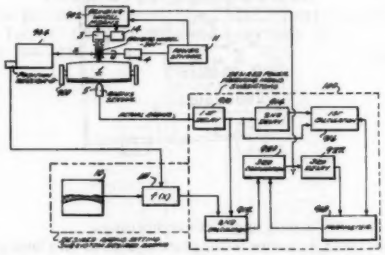
Kazuo Nagashima, Shizuoka, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1982, Ser. No. 406,911

Claims priority, application Japan, Aug. 20, 1981, 56-130732

Int. Cl.³ G06F *15/46;* G05B *19/18*

U.S. Cl. 364—475 **28 Claims**



1. A control system for a roll grinding machine, comprising:

means for rotating a roll to be ground;

a grinding wheel for grinding the roll;

means for rotating the grinding wheel;

means for moving the grinding wheel longitudinally parallel to an axis of the roll;

means for sensing the power being expended by the grinding wheel rotating means and generating an actual power signal indicative thereof;

means for detecting an actual radius of the roll at the longitudinal position of the grinding wheel and providing an actual radius signal indicative thereof;

means for detecting the longitudinal position of the grinding wheel and generating a longitudinal position signal indicative thereof;

desired radius producing means for producing a desired radius signal representing a desired radius corresponding to the longitudinal position signal; and

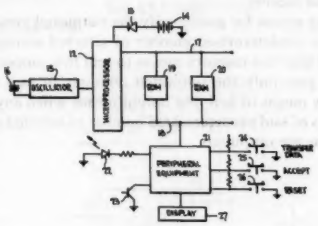
desired power producing means for producing, responsive to a predetermined function of the actual and desired radius signals, a desired power signal; and

grinding wheel driving means for pressing said grinding wheel against said roll with a pressure that is a function of said desired power signal and said actual power signal so as to minimize any difference between actual and desired power.

4,516,213
MULTIPLE RATE METERING SYSTEM

Robert A. Gidden, Brampton, Canada, assignor to E. Grant Deans, Toronto, Canada

Filed Feb. 1, 1982, Ser. No. 344,500
Int. Cl.[3] G01R 21/00
U.S. Cl. 364—483 11 Claims



1. A multiple rate metering system suitable for use with an existing single rate, electromechanical electricity meter employing an Eddy current disc mounted in a casing, comprising:

a first retrofit unit mountable inside the casing of the electricity meter;

and a second unit, which is portable so that it can be brought into close proximity with said first unit by a meter reader;

said first unit comprising a sensor for generating pulses in response to rotation of the Eddy current disc, a first microprocessor, a first read-only-memory for storing a program to control the operation of said first microprocessor, a random-access-memory, said first microprocessor being programmed to store data in said random-access-memory related to the pulses generated in different predetermined periods during which different electricity rates apply, and first coupling means for establishing non-contact communication through the casing with said second unit when said second unit is brought into close proximity with said first unit;

said second unit comprising second coupling means cooperating with said first coupling means to transmit and receive data to and from said first unit, a second microprocessor, a second read-only-memory for storing a program controlling the operation of said second microprocessor, a storage medium for storing data from said second microprocessor, display means, first actuator means operable by the meter reader to transmit a signal through said first and second coupling means to instruct said first microprocessor to transfer data relating to the pulses generated in said different predetermined periods to said second unit, said second microprocessor being programmed to display said data in said display means, and second actuator means operable by the meter reader to accept said data and instruct said second microprocessor to store said data in said storage medium with appropriate customer identification for subsequent retrieval at a central location.

4,516,214
POWER FAILURE ALARM CIRCUIT PERMITTING ORDERLY SHUTDOWN OF MICROPROCESSOR LOAD

Richard C. Ray, Randolph Township, Morris County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 12, 1982, Ser. No. 441,108
Int. Cl.[3] G06F 15/56
U.S. Cl. 364—483 6 Claims

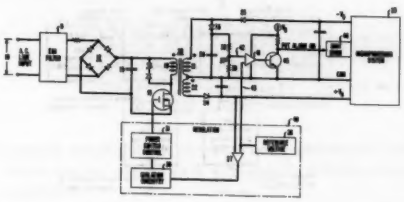
1. A converter adapted to be energized from an AC line and including an alarm circuit for notifying a shutdown control of a microprocessor load that AC line power is about to fail comprising:

means for storing a replica of voltage of a primary side of the converter on the secondary side including capacitive storage means in a circuit shunting a secondary winding of a power transformer of the converter,

a comparator for comparing a voltage stored in the capacitive storage means with a reference voltage,

an input filter capacitor operative for providing hold over voltage capacity

means, responsive to the comparator, for generating an alarm signal, the alarm circuit being operative for generating an alarm signal indicating impending failure of the AC line power when voltage on the input filter capacitor



drops to a level at which a predetermined output regulated voltage cannot be maintained beyond a predetermined time,

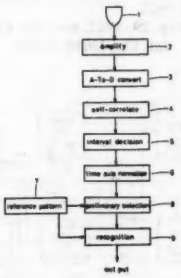
means for coupling the alarm signal to the shutdown control, comprising a transistor switch coupled to gate a DC energizing voltage to the shutdown control of the microprocessor load, and

voltage regulation circuitry including an error voltage amplifier wherein the comparator and the error voltage amplifier utilize a common reference voltage.

4,516,215
RECOGNITION OF SPEECH OR SPEECH-LIKE SOUNDS

Mitsuhiro Hakaridani; Hiroyuki Iwahashi, both of Nara, and Yoshiki Nishioka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1982, Ser. No. 416,165
Claims priority, application Japan, Sep. 11, 1981, 56-144449
Int. Cl.[3] G10L 1/00
U.S. Cl. 364—513.5 1 Claim



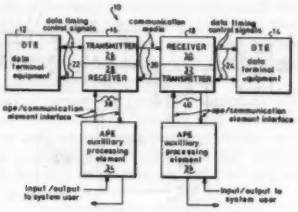
1. A method of speech recognition comprising the steps of creating self-correlation functions for input sound signals, deciding the intervals of the sound signals, normalizing the time axes in conjunction with the sound intervals, and conducting recognition of words or the like through decisions using said self-correlation functions as feature parameters where there is matching with reference patterns,

said method further comprising the step of effecting preliminary selection prior to the final recognition step by means of linear matching using said self-correlation functions of lower degrees.

4,516,216
IN-SERVICE MONITORING SYSTEM FOR DATA COMMUNICATIONS NETWORK

Thomas R. Armstrong, Largo, Fla., assignor to Paradyne Corporation, Largo, Fla.

Continuation of Ser. No. 230,456, Feb. 2, 1981, abandoned, which is a continuation of Ser. No. 17,042, Mar. 2, 1979, abandoned. This application May 10, 1982, Ser. No. 376,741
Int. Cl.³ H04B *3/14*
U.S. Cl. 364—514 **5 Claims**



1. In a data communication network for exchanging quadrature amplitude modulated signals between two first and second data communication equipment over a communication channel at least one of said first and second data communication equipment having an auxiliary processing equipment comprising:

eye pattern means for receiving eye pattern signals corresponding to said quadrature amplitude modulated signals;

digital input means for receiving digital control signals from the corresponding digital communication equipment;

analog input means for receiving analog signals from the corresponding digital communication equipment;

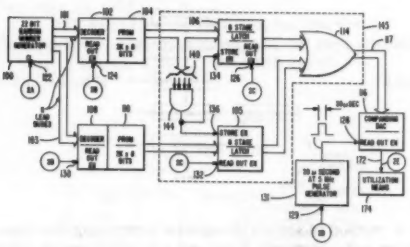
signal processing means for analyzing and processing signals from said eye pattern means, digital input means, and analog input means and adapted to generate output signals indicative of the status of said data communication network; and

output means for selectively transmitting said output signals.

4,516,217
EVENT SELECTOR FOR WIDE RANGE PROBABILITY OF OCCURRENCE

Eugene R. Starner, Maple Shade, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 29, 1982, Ser. No. 428,432
Int. Cl.³ H03B *29/00*
U.S. Cl. 364—717 **8 Claims**



1. An event selector comprising:

a random number generator for randomly generating a first plurality of random number generator addresses, said plurality being equal to the digit two raised to an integer power, said integer being the sum of second and third integers;

first and second memory logic means each having input and output terminals and further having a second and third plurality of storage locations, respectively, said second plurality being equal to the digit two raised to said second integer power and said third plurality being equal to the digit two raised to said third integer power, with each storage location containing a predetermined stored word and each responsive to selected ones of said addresses to output onto said output terminals the contents of the storage locations accessed by said selected addresses;

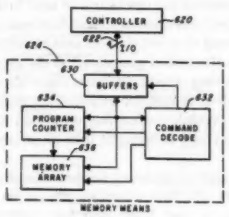
first output means;

first gating means for gating only the outputted contents of all but a predetermined number of selected storage locations of said first memory means to said first output means and to gate only the outputted contents of said second memory means to said first output means when any of the contents of said predetermined number of selected storage locations are outputted.

4,516,218
MEMORY SYSTEM WITH SINGLE COMMAND SELECTIVE SEQUENTIAL ACCESSING OF PREDETERMINED PLURALITIES OF DATA LOCATIONS

Stephen P. Hamilton, Midland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 26, 1980, Ser. No. 163,025
Int. Cl.³ G06F *9/32, 13/06, 15/02*
U.S. Cl. 364—900 **11 Claims**



1. A memory system comprising:

a bidirectional bus means coupled to a source for providing command signals, address signals and data signals;

a command decode means coupled to said bus means for generating respective first, second and at least a third decode outputs in response to receipt of first, second and at least a third command signals;

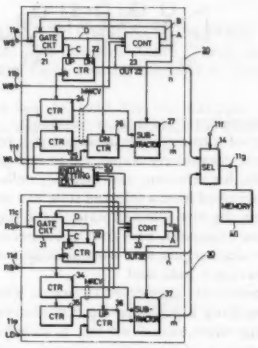
a program counter means coupled to said bus means and to said command decode means for storing therein an address corresponding to an address signal received via said bus means upon receipt of said first decode output, for generating an address signal corresponding to said address stored therein upon receipt of said second decode output, and for sequentially and repetitively generating an address signal corresponding to said address stored therein and incrementing said address stored therein upon receipt of said third decode output, this sequential and repetitive operation being repeated a predetermined number of times corresponding to said third command signal; and

a memory array coupled to said bus means, said command decode means and said program counter means, having a plurality of multibit data words stored at memory locations therein corresponding to said address signals, for providing multibit data words as data signals to said bus means upon receipt of said address signals from said program counter means in response to either said second decode output or said third decode output from said command decode means.

4,516,219
ADDRESS DESIGNATING METHOD OF MEMORY AND APPARATUS THEREFOR

Masayuki Ishida, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,403
Claims priority, application Japan, Dec. 18, 1981, 56-205766; Jun. 21, 1982, 57-10807
Int. Cl.³ G06F *9/32*
U.S. Cl. 364—900 **18 Claims**



1. A method of designating addresses of a memory by dividing the addresses of the memory into row addresses of row addressing and column addresses of column addressing, said method comprising the steps of,

on the occasion of the writing of the data in said memory,

adding a predetermined integer value B in succession to said column addressing by maintaining said row addressing in a predetermined positive integer value A,

subtracting a predetermined integer value D from said row addressing responsive to reaching of said column addressing to a predetermined positive integer value C, and

subtracting in succession a predetermined integer value B from said row addressing while subtracting said predetermined integer value B in succession from said column addressing in accord therewith, and

on the occasion of the reading of the data from said memory,

adding said predetermined integer value E in succession to said row addressing obtained by subtracting a predetermined integer value F from said predetermined integer value A, while adding said predetermined integer value B in succession to said column addressing in accord therewith,

subtracting a predetermined integer value G from said row addressing responsive to reaching of said column addressing to said predetermined integer value C, and

subtracting said predetermined integer value B in succession from said column addressing by maintaining said row addressing in a predetermined positive integer value H.

4,516,220
PULSE DEINTERLEAVING SIGNAL PROCESSOR AND METHOD

William J. Baumann, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1982, Ser. No. 404,004
Int. Cl.³ G06F *15/336*
U.S. Cl. 364—715 **7 Claims**

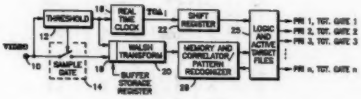
1. A pulse deinterleaving signal processor comprising:

an amplitude threshold circuit providing an output signal in response to the application thereto of each input pulse exceeding a predetermined threshold;

a timing circuit connected to receive the output signals from said threshold circuit and provide a time of arrival signal at an output thereof in response to each output signal received from said threshold circuit;

a sampling device connected to receive the input pulses and provide a plurality of samples of each pulse exceeding the predetermined threshold in response to an output signal from said threshold circuit;

a transform circuit connected to receive the plurality of samples from said sampling device and provide a plural point transform, spectral signature of each sampled pulse at an output thereof;



a memory coupled to the output of said transform circuit for receiving and storing each substantially different spectral signature;

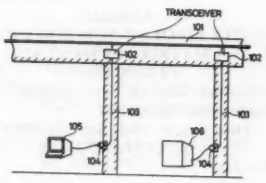
a pattern recognizer/correlator connected to receive each spectral signature from said transform circuit and connected to said memory for comparing each received spectral signature with each stored spectral signature to determine pulses from a common source; and

logic circuitry coupled to said correlator and said timing circuit for determining the time interval between pulses from a common source.

4,516,221
DATA COMMUNICATION SYSTEM

Yukio Nakata, Kawasaki; Matsuaki Terada, Machida; Kaoru Suda, Ohmiya; Motoyoshi Morito, Iruma, and Osamu Shiotsu, Ohmiya, all of Japan, assignors to Hitachi, Ltd. and Yagi Antenna Co., Ltd., both of Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,642
Claims priority, application Japan, Jun. 26, 1981, 56-98217
Int. Cl.³ H04B *9/00*
U.S. Cl. 364—900 **8 Claims**

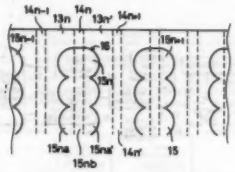


1. A data communication system comprising: first means for receiving and transmitting optical signals, including first light receiving means for receiving light modulated to communicate data and converting said light into an electric signal and first light emitting means for diffusing and radiating light modulated to communicate data in response to the electrical signal obtained from said first light receiving means; a plurality of second means for transmitting and receiving optical signals, each including second light emitting means disposed in optical communication through the air with said first means for converging and radiating light modulated to communicate data in accordance with a received transmission data signal and second light receiving means in optical communication through the air with said first means for receiving the light from said first light emitting means and converting it into an electrical signal representing receiving data; and third means for transmitting the transmission data signal to a second light emitting means and receiving the electric signal representing receiving data from a second light receiving means.

4,516,222
LAMINATED MAGNETIC BUBBLE DEVICE

Yoshifumi Sakurai, Osaka, and Takuhisa Numata, Hyogo, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 435,097
Claims priority, application Japan, Oct. 19, 1981, 56-166722
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—32 **15 Claims**

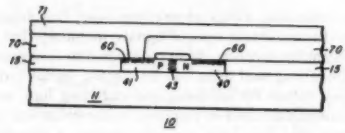


1. A laminated magnetic bubble device comprising at least one thin magnetic film having vertically oriented anisotropy and low coercive force and at least one thin magnetic film having vertically oriented anisotropy and high coercive force laminated with each other on a substrate, said thin film of high coercive force being magnetized to form a plurality of stable magnetic domains whose directions of magnetization are different from each other with their adjoining domains, said magnetic domains in said thin film of high coercive force being arranged in stripes, each stripe extending along a bubble transferring circuit pattern for defining bubble moving region to prevent the bubble from jumping out to another circuit pattern.

4,516,223
HIGH DENSITY BIPOLAR ROM HAVING A LATERAL PN DIODE AS A MATRIX ELEMENT AND METHOD OF FABRICATION

Donald A. Erickson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 3, 1981, Ser. No. 289,357
Int. Cl.³ G11C *11/36*
U.S. Cl. 365—175 **2 Claims**

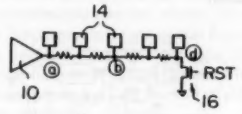


1. A semiconductor read-only memory comprising:
a silicon subtrate;
a first addressing means, comprising an N-type polysilicon region in said substrate;
a second addressing means, comprising a strip of conductive material on said substrate;
a laterial polysilicon PN junction diode, the P-type region being coupled to one of said addressing means, the N-type region being coupled to another of said addressing means, and the PN junction being located laterally between said P-type and N-type regions within said substrate.

4,516,224
SEMICONDUCTOR MEMORY

Keizo Aoyama, Yamato, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 28, 1982, Ser. No. 402,427
Claims priority, application Japan, Jul. 29, 1981, 56-118613
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—203 **13 Claims**

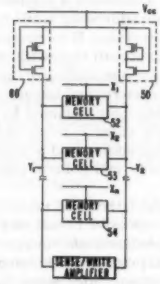


1. A semiconductor memory, comprising:
a plurality of memory cells arranged in a row;
a word line, operatively connected to said plurality of memory cells, for selecting said memory cells, said word line being switched from a selected state to a non-selected state and from the non-selected state to the selected state;
at least one transistor, operatively connected to said word line, for discharging said word line, said at least one transistor having a gate; and
means, operatively connected to said at least one transistor for generating a pulse having a predetermined width by detecting when said word line is switched from the selected state to the non-selected state and for turning on said at least one transistor for a predetermined period of time, thereby accelerating the discharge of the word line from the selected state to the non-selected state.

4,516,225
MOS DEPLETION LOAD CIRCUIT

Bruce A. Frederick, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 18, 1983, Ser. No. 467,676
Int. Cl.³ H03K *17/687*; G11C *7/00*
U.S. Cl. 365—203 **3 Claims**



1. A memory circuit comprising:
memory means for storing data;
data input/output means coupled to said memory means by two sense lines for supplying data to and for receiving data from said memory means; and
load means coupled between a voltage source and said sense lines for charging said sense lines to a predetermined voltage, said load means including first enhancement and depletion mode field effect transistors coupled between one of said sense lines and said voltage source and second enhancement and depletion mode field effect transistors coupled between the other one of said sense lines and said voltage source, each of said enhancement mode field effect transistors having a source terminal connected to one of said sense lines, a gate terminal connected to said voltage source, and a

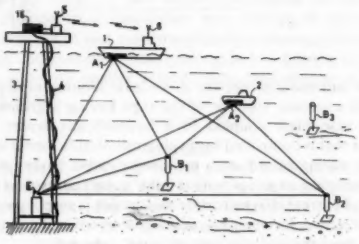
drain terminal connected to an intermediate node, each of said depletion mode field effect transistors having a drain terminal connected to said voltage source, a source terminal connected to its corresponding intermediate node, and a gate terminal connected to one of said sense line or said corresponding intermediate node, whereby said predetermined voltage is substantially equal to the voltage of said voltage source minus the threshold voltage of said enhancement mode field effect transistor.

4,516,226

ACOUSTIC POSITIONING SYSTEM

Francois Peynaud; Jean Gosselin; André Farcy, and Bernard Grandvaux, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 24, 1982, Ser. No. 423,321
Claims priority, application France, Jan. 12, 1982, 82 00370
Int. Cl.³ G01S *1/72, 15/88*
U.S. Cl. 367—6 **6 Claims**



1. A system for determining the position of a vessel, comprising:

a beacon located at a first determined place for transmitting at determined times first acoustic pulses having a first frequency f;

at least two transponders located remote from said beacon at second separate determined places for transmitting under the control of said first pulses, second acoustic pulses having second frequencies f_i, each one of said second frequencies being related to one of said at least two transponders; and

computing means integral to said vessel for receiving said first and second acoustic pulses, for determining the elapsed times since the emissions of these pulses, and for computing the positions of the vessel from said elapsed times and from said first and second location places, respectively, of the beacon and said at least two transponders.

4,516,227

SUBOCEAN BOTTOM EXPLOSIVE SEISMIC SYSTEM

Kenneth R. Wener, and Anthony R. Tinkle, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 4, 1981, Ser. No. 327,315
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—15 **3 Claims**

1. A system utilized with a boat **210** for suboceanic seismic exploration of the earth formations **(20)** beneath the ocean bottom **(80)**, said system comprising:

at least one subocean bottom seismic apparatus **(10)**, said apparatus comprising:

(a) a seismic device **(340)**,

(b) an elongated tube **(330)** for internally holding said seismic device **(340)** near the bottom end of said tube **(330)**,

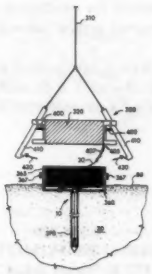
(c) a container **(360)** connected to the upper end of said tube **(330)**,

(d) a signal cable **(30)** coiled in said container **(360)**, said signal cable **(30)** electrically connected to said seismic device **(340)**, and

(e) a plurality of catches **(367)** mounted on the sides of said container **(360)**,

a weighted planting unit **(300)** selectively engaging said seismic apparatus **(10)** and having sufficient weight **(320)** for planting said tube **(330)** vertically into said ocean bottom **(20)** as said planting unit **(300)** is lowered, said weighted planting unit comprising:

holding arms **(410)** on said planting unit **(300)** and operatively engaging said catches **(367)** when said planting unit and said apparatus are lowered, and



means **(400)** operative on said holding arms **(410)** for releasing said holding arms **(410)** from said catches **(367)** after said apparatus **(10)** has been implanted beneath said ocean bottom **(80)**, and

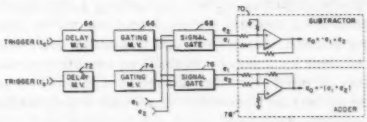
means **(220)** on said boat **(210)** for lowering said planting unit **(300)** attached to said apparatus **(10)** into said ocean thereby planting said apparatus **(10)** into said ocean bottom **(80)** so that said planting unit automatically releases from said apparatus **(10)** after implantation, said lowering means **(220)** being further capable of raising said planting unit **(300)** and signal cable after said release to the surface of said ocean, said apparatus **(10)** also being capable of being retrieved from said ocean bottom by said lowering means through selective connection to said signal cable.

4,516,228

ACOUSTIC WELL LOGGING DEVICE FOR DETECTING COMPRESSIONAL AND SHEAR WAVES

Joseph Zemanek, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1983, Ser. No. 526,199
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—75 **1 Claim**



1. A well logging device for continuously logging both the compressional and shear wave transmission characteristics of formations surrounding a borehole comprising:

(a) a multidirectional acoustic transmitter for imparting compressional waves into the formations surrounding the borehole,

(b) a point force acoustic transmitter for imparting shear waves into the formations surrounding the borehole,

(c) means for triggering said transmitters to alternately impart said compressional and shear waves into said formations,

(d) a receiver mounted on said logging device in spaced

relation from said transmitters, said receiver comprising a bender-type transducer having a single pair of opposed unrestricted piezoelectric planar surfaces, oriented along the longitudinal axis of said tool,

(e) means initiated by the triggering of said multidirectional transmitter for producing a first gating pulse during the expected arrival time of a compressional wave at said receiver,

(f) means responsive to said first gating pulse for subtracting the voltages produced across each of said piezoelectric planar surfaces of said receiver in response to a compressional wave,

(g) means initiated by the triggering of said point force acoustic transmitter for producing a second gating pulse during the expected arrival time of a shear wave at said receiver, and

(h) means responsive to said second gating pulse for adding the voltages produced across each of said piezoelectric planar surfaces of said receiver in response to a shear wave.

4,516,229

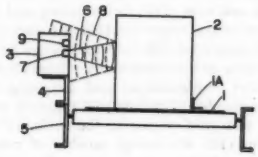
OSCILLATOR PROXIMITY SWITCH

William F. Kearns, 177 E. Weber Rd., Columbus, Ohio 43202

Filed Aug. 9, 1982, Ser. No. 406,309

Int. Cl.³ G01S *15/08, 7/52*

U.S. Cl. 367—95 **5 Claims**



1. An acoustic distance measuring system wherein a remote surface reflects acoustic waves from a transmitter back to a receiver, completing a feedback loop, inducing oscillation in the system when the reflected waves are generally in phase with and reinforcing the transmitted waves, said oscillations rapidly dying out when the reflected waves are roughly one-half wavelength out of phase with the transmitted waves, so that the reflected waves are generally cancelling the transmitted waves, the presence or absence of said oscillations being employed to detect a relatively small change in the position of the remote reflecting surface; comprising a transmitter means for generating acoustic waves; a receiver means oriented to receive acoustic waves from said transmitter after said waves are reflected by a remote surface; an amplifier means which receives its input from the said receiver means and passes its output to the said transmitter means and which oscillates at a characteristic frequency when the feedback path length between the said transmitter and the said receiver is such that the reflected waves are generally in phase with and reinforcing the transmitted waves, said amplifier ceasing to oscillate when the feedback path length between the said transmitter and the said receiver is such that the reflected waves are approximately one-half wavelength out of phase with the transmitted waves so that the reflected waves are generally cancelling the transmitted waves, the oscillations ceasing when the reflected waves are about one-quarter wavelength out of phase with the transmitted waves; a detector means responsive to the presence of said oscillations which changes the state of a relay means to control an external load.

4,516,230

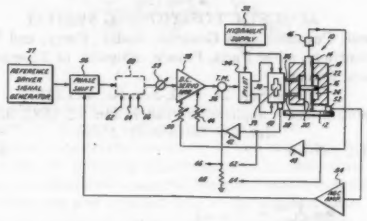
PROTECTIVE DRIVE-LEVEL LIMITER FOR AN ELECTRO-HYDRAULIC VIBRATOR

Kent J. Goodloe, and Ralph A. Landrum, Jr., both of Houston, Tex., assignors to Western Geophysical Company of America, Houston, Tex.

Continuation of Ser. No. 255,205, Apr. 17, 1981, abandoned. This application Aug. 5, 1983, Ser. No. 508,232

Int. Cl.³ G01V *1/04, 1/14, 1/16*

U.S. Cl. 367—190 **5 Claims**



1. An automatic protective drive-level limiting network for use with a seismic vibrator of the type having a ground contacting base plate coupled to a hydraulically-driven linear actuator that is controlled by an electrohydraulic servo mechanism consisting of at least a main servo valve having a valve spool, coupled in series with a pilot valve controlled by an electrical current-driven torque motor that is responsive to an input reference driver signal, said actuator and said valve spool having mechanical displacement limits, comprising:

means for generating first and second error signals when said valve spool and said actuator approach their respective mechanical displacement limits within a predetermined clearance;

means for monitoring the current flow through said torque motor;

means coupled to said monitoring means for generating a third error signal when said current flow in said torque motor exceeds a preselected upper limit; and

means coupled to said error signal generating means for attenuating said input reference driver signal as a function of the larger of said first, second, and third error signals.

4,516,231

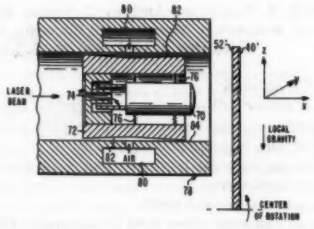
OPTICAL DISC SYSTEM HAVING MOMENTUM COMPENSATION

Theodore D. Michaelis, Medford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,973

Int. Cl.³ G11B *7/12, 21/00*

U.S. Cl. 369—44 **12 Claims**



1. In a data processing system for use in recording or retrieving information, said information being recorded in tracks on a

surface of a disc-shaped record medium, said system comprising support means for supporting said data processing system, transducer means for recording or retrieving said information in said tracks, motion establishing means for establishing relative motion between said transducer means and said record medium, and means for generating movement of said motion establishing means, said movement producing a counter movement, said counter movement tending to move said support means, an improvement for absorbing said counter movement from said support means, said improvement comprising:

a momentum compensation mass movably positioned intermediate said motion establishing means and said support means, said momentum compensation mass decoupling said motion establishing means from said support means, said momentum compensation mass reactively coupled to said motion establishing means for absorbing said counter movement produced by said movement of said motion establishing means;

said momentum compensation mass having weight greater than the weight of said motion establishing means;

said momentum compensation mass moving in reaction to movement of said motion establishing means, said momentum compensation mass moving in an opposite direction to, and with smaller velocity than, said motion establishing means.

4,516,232

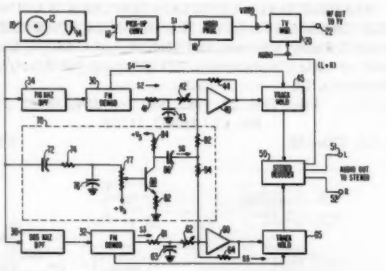
VIDEO DISC PLAYER WITH COMPENSATION FOR STYLUS HOLDER MECHANICAL RESONANCE

John A. van Raalte, and George H. N. Riddle, both of Princeton, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 26, 1982, Ser. No. 382,199

Int. Cl.[3] G11B *9/06;* **H04N** *5/76*

U.S. Cl. 369—126 **9 Claims**



1. A video disc player for playback of video disc records of the capacitive information storage type, comprising:

a capacitance sensing pick-up cartridge including a stylus supported by a stylus holder, said stylus holder being mechanically resonant at a frequency within an audio frequency range;

pick-up converter means coupled to said stylus for providing a broadband output signal inclusive of an audio FM carrier wave subject to modulation by said mechanically resonant stylus holder;

first means for demodulating the audio FM carrier wave to provide a baseband audio output signal inclusive of a noise component representative of the mechanical resonance of said stylus holder; and

second means for linearly combining said baseband audio output signal of said first means with an un-demodulated component of the broadband output signal produced by said pick-up converter means to provide a resultant audio output signal in which the mechanical resonance induced noise component is attenuated.

4,516,233

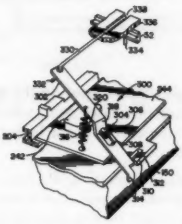
DISC RECORD PLAYER HAVING PLAYER CONTROL APPARATUS

Thomas F. Kirschner, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1983, Ser. No. 556,254

Int. Cl.[3] G11B *17/04, 25/04, 5/82*

U.S. Cl. 369—79 **7 Claims**



1. In a player for recovering prerecorded information from a turntable-supported disc record by a signal pickup when pickup/record relative velocity is established; said signal pickup being housed in a carriage, which is translatably mounted in said player between an off position out of registry with, and an end-of-play position in registry with said turntable-supported record; said record being removably received in a protective caddy comprising a jacket and a record retaining spine; said spine and an associated record forming a record/spine assembly; said player being further equipped with a record extraction mechanism which withdraws said record/spine assembly from said jacket for retention inside said player upon jacket retraction subsequent to caddy insertion into said player; said carriage being driven toward said record for playback, and, after playback, driven to a standby position near said off position; an empty caddy being inserted into said player for retrieving said retained record/spine assembly; said carriage being driven to said off position upon retrieval of said record/spine assembly from said player; player control apparatus comprising:

(A) a switch subject to conditioning in an off state and an on state to, respectively, turn off and turn on power to said player;

(B) a switch actuating lever movably mounted in said player between a first position and a second position; said lever being displaced to said second position in response to the presence of said spine in said player to turn on said switch; said lever, when occupying said second position thereof, allowing to-and-fro motion of said carriage without hindrance; said lever moving back to said first position thereof in the absence of said spine in said player during the motion of said carriage to said off position to turn off said switch.

4,516,234

OPTICAL RECORDING SYSTEM

Shiro Nakagawa, and Akihiko Kuroiwa, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,556

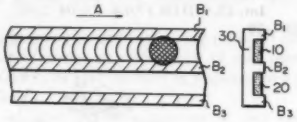
Claims priority, application Japan, Jun. 24, 1981, 56-96759

Int. Cl.[3] G11B *7/00*

U.S. Cl. 369—109 **5 Claims**

1. An optical recording system comprising a laser beam source; modulation means for modulating the intensity of the laser beam of said laser beam source; separation means which passes the beam from said laser beam source but separates a reflection beam in the opposite direction; means for converting optical energy to electrical energy to provide reproduced signal according to the separated reflection beam from said separation means; focusing lens for focusing the beam on the surface of the recording medium; wherein said recording medium is made of heat-meltable material which is melted by

illuminating a laser beam to provide a pit corresponding to data to be stored; and wherein relative movement of said recording medium to the laser beam is such that the spacing between each adjacent pit in the relative movement direction of a re-



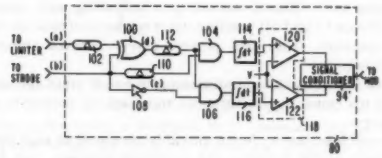
cording medium and a laser spot on the recording medium is less than a diameter of a laser spot, which is defined by the threshold value of the energy of the laser beam for melting the recording medium.

4,516,235

DYNAMIC RECORD LEVEL CONTROL FOR OPTICAL DISC RECORDER

Richard J. Tarzaiski, Magnolia, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 28, 1982, Ser. No. 437,264
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—116 **4 Claims**



1. In a data processing system for use in recording or retrieving information signals, said information signals being recorded in tracks on a surface of a record medium, an apparatus comprising:

recorder means for recording said information signals in said tracks on said record medium;

control means for controlling said recorder means to operate at a record level, said record level being controlled such that surface effects are produced on said record medium;

retrieve means for retrieving said information signals from said record medium, said retrieve means being arranged to read said information signals temporally after said information signals are recorded by said recorder means;

detector means for detecting variations in the content of said retrieved information signals, said detector means further including means responsive to said retrieved information signals for generating first and second derived information signals, and means for exclusively OR-ing said first derived information signals with said second derived information signals to effect said variations; and

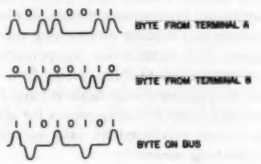
adjustment means responsive to said detector means for dynamically adjusting said control means to maintain said record level at a level such that said surface effects are representative of said information signals.

4,516,236

FULL-DUPLEX TRANSMISSION OF BIT STREAMS SERIALLY AND IN BIT-SYNCHRONISM ON A BUS BETWEEN TWO TERMINALS.

Faruk Hadziomerovi , Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 26, 1983, Ser. No. 535,423
Int. Cl.³ H04B *1/56*
U.S. Cl. 370—24 **6 Claims**



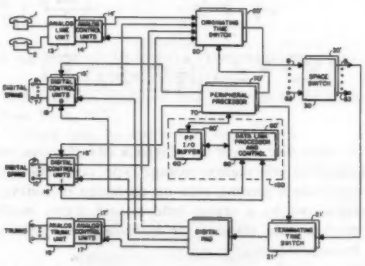
4. Apparatus comprising a bus and two terminals coupled thereto for full-duplex transmission of bit streams serially and in bit-synchronism therebetween, each terminal comprising means for supplying a bit stream to be transmitted to the bus in the form of a unipolar pulsed signal, the polarities of the unipolar pulsed signals supplied to the bus by the two terminals being opposite to one another, each terminal further comprising means responsive to pulses on the bus for producing a received bit stream, and an exclusive-OR gate responsive to the received bit stream and to the bit stream transmitted by the terminal to produce a recovered bit stream corresponding to the bit stream transmitted by the other terminal.

4,516,237

REMOTE DATA LINK CONTROLLER HAVING MULTIPLE DATA LINK HANDLING CAPABILITIES

Thomas J. Perry, Phoenix, and Muhammad I. Khera, Glendale, both of Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 22, 1983, Ser. No. 564,138
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—58 **8 Claims**



1. A remote data link controller for processing control data in a telecommunication switching system, said telecommunication switching system including a peripheral processor and a plurality of digital data links for sending data messages in the form of message bytes to a plurality of remote located telecommunication switching systems, said remote data link controller comprising:

peripheral processor output buffer means connected to said peripheral processor, said peripheral processor output buffer means including a plurality of transmit buffers, each transmit buffer associated with one of said plurality of digital data links, each transmit buffer arranged to store a

plurality of control data in the form of data words from said peripheral processor;

formatting means connected to said peripheral processor output buffer means, said formatting means disposed to process sequentially one data word from each of said plurality of transmit buffers, assembling each data word into a message byte;

temporary memory means connected to said formatting means, said temporary memory means including a plurality of memory location areas, each memory location area associated with one of said plurality of digital data links, said temporary memory means arranged to receive and store in each memory location area a completed message byte and a partially completed message byte processed by said formatting means for each of said plurality of digital data links;

counter means connected to said temporary memory means, arranged to count the number of message bytes assembled for each of said plurality of digital data links and a count of the number of data bits contained in a partially completed message byte, said counter means outputting said count of message bytes and said count of the number of bits in a partially completed message byte to a respective one of said memory location areas associated with each of said plurality of digital data links;

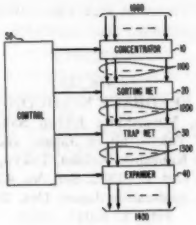
a plurality of data link output buffers connected to said temporary memory, each of said plurality of data link output buffers connected to a plurality of digital data links, each data link output buffer arranged to receive from said temporary memory in sequential order a message byte to be transmitted over a respective digital data link.

4,516,238

SELF-ROUTING SWITCHING NETWORK

Alan Huang, Ocean, and Scott C. Knauer, Englishtown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 28, 1983, Ser. No. 479,668
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—60 **15 Claims**



1. A switching network having a plurality of output ports with unique numerical designations, said switching network being responsive to simultaneously applied signals and each of said input signals containing one of said numerical designations to specify a particular one of said output ports to which said each input signal is to be switched, comprising:

a sorting network, responsive to said applied input signals, for sorting said applied input signals in ascending order of said contained numerical designations, forming thereby a sorted signal set; and

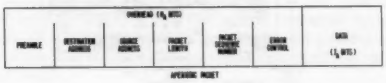
means, responsive to said numerical designations embedded in said sorted signal set, for switching each signal of said sorted signal set to the particular one of said output ports specified by said numerical designation contained in said each signal.

4,516,239

SYSTEM, APPARATUS AND METHOD FOR CONTROLLING A MULTIPLE ACCESS DATA COMMUNICATIONS SYSTEM INCLUDING VARIABLE LENGTH DATA PACKETS AND FIXED LENGTH COLLISION-FREE VOICE PACKETS

Nicholas F. Maxemchuk, Mountainside, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 15, 1982, Ser. No. 357,850
Int. Cl.³ H04J *3/02, 6/00*
U.S. Cl. 370—85 **8 Claims**



1. A method for controlling digital signals in a communications system, said system including a communications channel, a plurality of station sources, at least two of said sources being adapted to be coupled to said channel, said method including the steps of

receiving signals from said channel,

responsive to said received signals, detecting the busy/idle status of said channel,

responsive to said channel being detected as busy waiting for an idle channel and

at least one of said station sources is a station source of a first kind and at least one other of said station sources is a station source of a second kind, and

said method further comprises the steps of:

responsive to said channel being detected as idle, acquiring access to said channel;

responsive to acquiring said channel, transmitting a packet from a first source to a second source on said channel;

responsive to said packet being from a first source of said first kind, said transmitting step further including the steps of

including a preempt field in said packet, said preempt field comprising a delay signal, said delay signal lasting a predetermined time interval, and

continuing to transmit said packet without listening to said channel; and

responsive to said packet being from a first source of said second kind, said transmitting step further including the step of

listening to said channel while continuing to transmit said packet, said listening step further comprising the steps of

upon detecting a collision while listening to said channel, terminating any transmitting from said first source of said second kind within a time interval that is no more than the predetermined time interval of said preempt field delay signal, and

responsive to said terminating, waiting for said channel to become idle before retransmitting said packet.

4,516,240

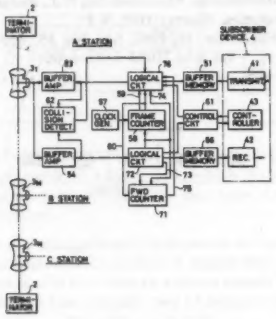
TIME DIVISION DIGITAL SIGNAL TRANSMISSION SYSTEM WITH BLOCK PACKING

Hiroshi Kume, and Yoichi Tan, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,235
Claims priority, application Japan, Dec. 3, 1982, 57/211472
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—85 **11 Claims**

1. In a multiple station communication network in which a station produced digital signal, transmitted over a communication cable, is fixedly positioned in a frame which is repeated periodically in time and is composed of a plurality of time blocks, the digital signals from the stations being transmitted in assigned time blocks, the first block in a frame being the master

block which carries a master station generated digital signal as a frame synchronization reference signal, the stations being connected through taps to said communication cable whereby digital signals are transmitted in a time division manner, the improvement comprising:



means for determining during each frame, the blocks which carry station produced digital signals, and

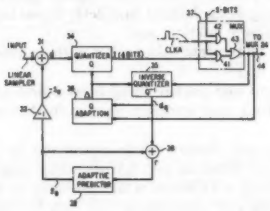
means for rearranging the digital signal carrying blocks such that all digital signal carrying blocks in a frame are arranged in a single group of contiguous blocks.

4,516,241

BIT COMPRESSION CODING WITH EMBEDDED SIGNALING

Robert L. Farah, Brooklyn, N.Y., and Stephen M. Walters, Aberdeen, N.J., assignors to AT&T Bell Laboratories, Murry Hill, N.J.

Filed Jul. 11, 1983, Ser. No. 512,329
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—110.1 **6 Claims**



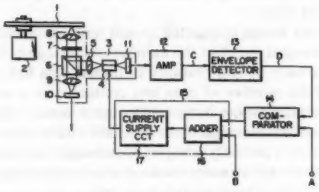
1. A bit compression coding circuit for converting a PCM input signal representative of PCM encoded speech or voiceband data into a bit compressed quantized differential PCM output signal with embedded signaling bits comprising a difference circuit **(31)** to which samples of the PCM input signal and a signal estimate of the same are coupled, said difference circuit providing an output difference signal indicative of the difference between the two inputs thereto, a predictor means **(32)** for producing said signal estimate, adaptive quantizing means **(34)** for receiving said difference signal and providing at its output a bit compressed quantized differential PCM version of the difference signal, multiplex means **(37)** coupled to the output of said quantizing means for periodically preempting the least significant bit of the bit compressed PCM signal and substituting a signaling bit therefor, means **(35, 38)** coupled to the output of said multiplex means for adding the signal therefrom with said signal estimate, the output of the adding means (r) being coupled to the input of the predictor means which in response thereto serves to generate the next signal estimate for comparison with the next input signal sample, and adaptation means **(36)** responsive to the output of said multiplex means for controlling the speed of adaptation of said quantizing means to produce a fast speed adaptation when the PCM input signal represents speech and a slow speed of adaptation for PCM encoded voiceband data.

4,516,242

OUTPUT STABILIZING DEVICE

Tsuneshi Yokota, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 14, 1982, Ser. No. 388,172
Claims priority, application Japan, Jun. 18, 1981, 56-94429; Mar. 15, 1982, 57-40601
Int. Cl.³ H01S *3/13*
U.S. Cl. 372—29 **6 Claims**



1. An output stabilizing device for use in a semiconductor laser system including a semiconductor laser oscillator, said system having a record mode and a playback mode, said device comprising:

optical sensor means for detecting a record laser beam and for detecting a playback laser beam and for outputting a monitor signal corresponding to the detected record or playback laser beam;

means for detecting a difference between a signal component of said monitor signal, and a reference signal, said means for detecting being used for setting a level of the playback laser beam, to thereby produce a playback component difference signal; and

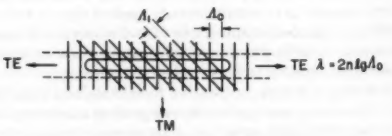
modulation drive means for adding a beam modulating signal to the playback component difference signal of said difference detecting means to generate an added signal and for providing a stabilized drive current output having an amplitude varied in accordance with the added signal to said semiconductor laser oscillator.

4,516,243

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER

Katsuyuki Utaka, Musashino; Kazuo Sakai, and Shigeyuki Akiba, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 436,928
Claims priority, application Japan, Oct. 29, 1981, 56-172061
Int. Cl.³ H01S *3/098*
U.S. Cl. 372—96 **5 Claims**



1. A distributed feedback semiconductor laser comprising, a semiconductor substrate, a plurality of semiconductor layers, first and second corrugations on said substrate for causing periodic refractive index variations in the travelling direction of light propagation in the laser for effectively causing loss of

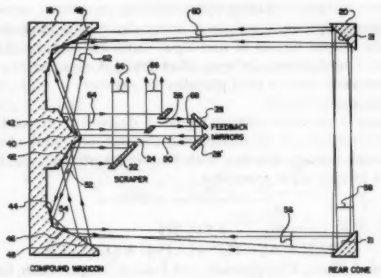
TM mode of oscillation and permitting oscillation in the TE mode alone, and electrodes on said substrate and on one of said semiconductor layers for injection of current into the laser.

4,516,244

COMMON-PASS DECENTERED ANNULAR RING RESONATOR WITH IMPROVED POLARIZATION CONTROL

Dale A. Holmes, Simi Valley, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 1, 1983, Ser. No. 528,493
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—99 **8 Claims**



1. In a CPDARR in a laser, having a waxicon mirror reflector with mirror surfaces, a rear ring mirror with a reflecting surface facing the waxicon mirror surfaces, a scraper mirror with a central aperture for passing an input feedback beam to the waxicon and an offset aperture for passing an output feedback beam from the waxicon, and feedback mirror means for reversing the direction of the output feedback beam to direct it upon the inner central axicon mirror of the waxicon, the improvement comprising:

compound waxicon reflecting means having five mirror surfaces, each coated with a conventional high-reflectance coating; and

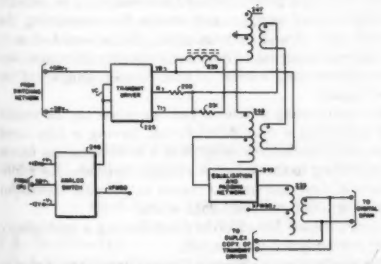
rear ring mirror means the mirror surface of which is coated with a conventional high-reflectance coating.

4,516,245

DIGITAL SPAN TRANSMISSION CIRCUIT

Thomas J. Perry, Phoenix, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,568
Int. Cl.³ H03K *5/01*
U.S. Cl. 375—17 **11 Claims**



1. In a telecommunications switching system having a CPU, a transmission circuit being connected to a digital span via a transformer and connected to a switching network via first and second input leads of said switching system for converting unipolar data of said switching network to bipolar data for said digital span, said transmission circuit comprising:

said switching network being operated to alternately transmit first and second input signals of a first value via said first and second input leads;

said transformer connected to said transmission circuit via first and second output leads;

first current control means connected between said first input lead and said second output lead and being operated in response to said first input signal of a first value to connect said first input lead to said second output lead;

second current control means connected between said first and second output leads, said second current control means being operated in response to said first input signal of said first value to permit a predetermined current to flow from said first to said second output lead via said transformer;

third current control means connected between said second input lead and said first output lead and being operated in response to said second input signal of a first value to connect said second input lead to said first output lead;

fourth current control means connected between said first and second output leads, said fourth current control means being operated in response to said second input signal of said first value to permit a predetermined current to flow from said second to said first output lead via said transformer; and

voltage control means connected to said second and to said fourth current control means and being operated to transmit a voltage to said second and fourth current control means for providing a voltage level of a first polarity or alternately to provide a voltage level of a second polarity;

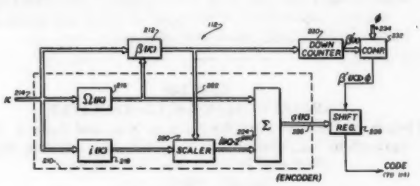
said first and second current control means being operated alternately with said third and fourth current control means in response to said first and said second input signals, respectively, to produce said bipolar data.

4,516,246

DATA COMPRESSION SYSTEM

James A. Kenemuth, Palo Alto, Calif., assignor to Prentice Corporation, Sunnyvale, Calif.

Filed Feb. 26, 1982, Ser. No. 352,681
Int. Cl.³ H04N *7/12*
U.S. Cl. 375—37 **21 Claims**



1. A data transmission system, comprising, in combination:

(a) transmitter means for creating codes as a function of a character based input data stream and including encoder means for encoding each character with a code having a bit length which is an inverse function of the frequency of appearance of the character in a sample of a predetermined number of immediately preceding characters in said data stream, said encoder means including code generating means for receiving said input data stream and for developing a code for each character received, and bit length means for receiving the same input data stream as said code generating means and for determining from said predetermined number of characters the number of bits of a code to be developed by the code generating means for a specific character k, said code having a bit length $\beta(k)$, where $\beta(k)$ is the smallest positive integer such that the non-zero probability p(k) of a character appearing in said

predetermined number of characters is > or = to 1/(2 to the β(k) power);

(b) data link means connected to said transmitter means for receiving the codes created by said encoder means; and

(c) receiver means connected to said data link means for receiving said codes generated by said transmitter means and for decoding the data back to a character based data stream.

4,516,247

SIGNAL RECEIVER WHICH INDICATES THE STATUS OF THE DEVICE CONNECTED THERETO

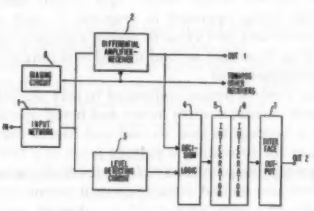
Henri Carsalade, Antibes; Francois-Xavier Delaporte, Cagnes-sur-Mer, and Jean-Pierre Pantani, Nice, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1983, Ser. No. 496,328

Claims priority, application European Pat. Off., Jul. 28, 1982, 82430019.8

Int. Cl.³ H03K *5/153;* **H04L** *25/06*

U.S. Cl. 375—56 **9 Claims**



1. A monolithic integrated receiver for receiving first signals of an input line and for providing at its output binary signals usable in data processing devices, characterized in that it includes:

an input network receiving said first signals and outputting a signal the amplitude of which is divided by factor k,

threshold voltage generating means for generating first and second threshold voltages at different times,

a differential amplifier with two inputs, the first one receiving the output signal of the input network and the second one receiving the threshold voltages.

4,516,248

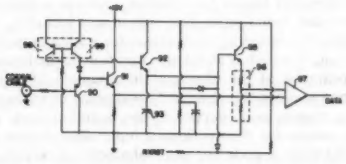
VARIABLE THRESHOLD RECEIVER

Thomas E. Barclay, Fort Washington, Md., and John A. Zett, Springfield, Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jan. 21, 1983, Ser. No. 459,896

Int. Cl.³ H03K *5/20*

U.S. Cl. 375—76 **5 Claims**



1. Apparatus for decoding a composite signal having a varying d.c. offset voltage comprising:

(a) an input transistor adapted to receive an input composite signal comprising discrete unipolar signals in varying sequence and amplitude and providing an output signal representative of said input signal at its emitter electrode;

(b) a threshold transistor having it base electrode electrically connected to the emitter electrode's said input transistor;

(c) a bias capacitor electrically connected between the emitter electrode of said threshold transistor and ground reference, the charging/discharging characteristics of said capacitor being related to the bandwidth of the composite signals so that the signal appearing at the emitter electrode of said threshold transistor is representative of the average peak amplitude levels in the composite signal;

(d) a threshold bias transistor having its base electrically connected to the emitter of said threshold transistor;

(e) a voltage divider network comprising a plurality of series-connected resistors, serially connected between the emitter electrode of said threshold bias transistor and ground; and

(f) an integrator/cosmparator having two input terminals, one of said input terminals being electrically connected to the output signals of said input transistor and the other of said input terminals being electrically connected to a point between two of said plurality of resistors in said voltage divider network;

whereby a decoded output signal is derived from said integrator/comparator by comparing the output signal obtained from said voltage divider with the signal obtained from the output of said input transistor.

4,516,249

RAILWAY SIGNALLING RECEIVER

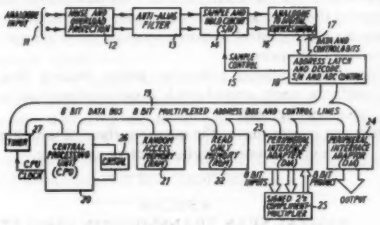
Andrew J. Cook, Chippenham, and Paul D. Negus, Bath, both of England, assignors to Westinghouse Brake & Signal Co. Ltd., Chippenham, England

Filed Dec. 16, 1982, Ser. No. 450,459

Claims priority, application United Kingdom, Dec. 22, 1981, 8138634; Aug. 18, 1982, 8223767

Int. Cl.³ H03D *3/18*

U.S. Cl. 375—82 **6 Claims**



1. A railway signalling receiver responsive to signals carried by track rails, said receiver comprising:

sensing means cooperating with the track rails for sensing the signals carred by the track rails, means for sampling a sensed signal at a predetermined sampling rate to provide a multiplicity of samples and means for converting the value of each of said samples into a digital word so as to provide over a period of time a multiplicity of digital data words representing a series of time domain samples of the sensed signal;

means for performing a heterodyne operation on the sensed signal including a multiplier means, having a first input connected to means for supplying a multiplication factor corresponding to the value of a cosine function, for multiplying said first and second inputs to provide an output comprising a heterodyned data word,

data memory means for receiving and storing a multiplicity of said heterodyned data words,

means for performing a discrete Fourier transform using as input data said multiplicity of heterodyned data words and including processing means for performing a predetermined mathematical operation, and a program memory means containing a sequence of processor instructions for

evaluating an algorithm for said discrete Fourier transform, said program memory means being connected to control the operation of the processing means,

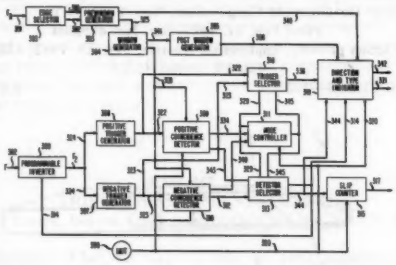
memory addressing means for interconnecting the data memory means and the processing means so as to input data to the processing means for storing intermediate and final results from the processing means produced by evaluation of the transform algorithm, and

means, connected to the memory addressing means and responsive to said final frequency domain results, for identifying the frequency components of the signal sensed by signal sensing means.

4,516,250
FREQUENCY AND PHASE COMPARATOR WITH SLIP DETECTION CAPABILITY

Gary J. Grimes, Thornton, Colo., assignor to AT&T Information Systems, Holmdel, N.J.

Filed Aug. 26, 1983, Ser. No. 526,642
Int. Cl.³ H03D *3/18*
U.S. Cl. 375—82 **24 Claims**



1. A frequency and phase comparator for detecting phase shifts indicative of frequency differences between a first signal F_R and a second signal F having identifiable preselected transitions, comprising:

means for applying said first and second signals to first and second inputs, respectively, of said comparator,

means responsive to the reception of each preselected transition in said first signal F_R for generating a window pulse,

means responsive to the reception of each preselected transition in said second signal F for generating a trigger pulse,

a detector for generating a coincidence signal in response to each coincidence between said window pulse and said trigger pulse,

means interposed between said second input and said trigger pulse generating means and responsive to the generation of alternate ones of said coincidence signals by said detector for inverting said second signal until the generation of the next coincidence signal, and

means responsive to the generation of alternate ones of said coincidence signals for generating a slip signal indicative of either two contiguous 180 degree phase shifts or a single 360 degree phase shift between said first and said second signals.

4,516,251
PROGRAMMABLE PRESCALER

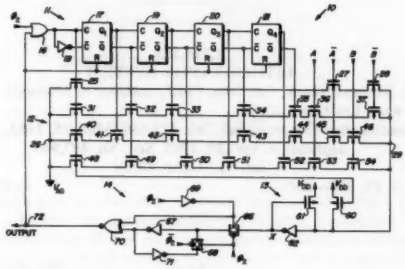
Michael G. Gallup, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1983, Ser. No. 501,315
Int. Cl.³ H03K *21/36*
U.S. Cl. 377—110 **12 Claims**

1. A programmable prescaler for providing an output signal which is synchronous with and proportional in frequency to a clock signal, comprising:

a plurality of series-connected flip flop circuits, a first of the flip flop circuits having an input coupled to the clock signal, the flip flop circuits counting a predetermined number of cycles of the clock signal, each of the flip flops providing a counter signal after a predetermined number of clock signal cycles and each having a reset terminal connected to an output of the prescaler;

decoder means coupled to the plurality of flip flop circuits and connected to an input control signal for scaling the frequency of the output signal to a predetermined fraction of the frequency of the clock signal, the decoder means



coupling a reference voltage node to a decoder output in response to at least one of the counter signals;

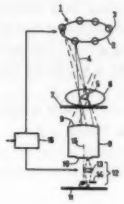
latch means having an input coupled to the decoder output, and having an output for temporarily providing a latched output; and

delay means having an input coupled to the output of the latch means, and having an output connected to the reset terminal of each flip flop circuit of the plurality of flip flop circuits at the prescaler output, for providing the output signal after a predetermined amount of time delay.

4,516,252
DEVICE FOR IMAGING LAYERS OF A BODY

Rolf Linde, Haseldorf, and Erhard Klotz, Halstenbek, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,837
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134076
Int. Cl.³ A61B *6/00*; G01T *1/29*; G03B *41/16*
U.S. Cl. 378—23 **15 Claims**



1. A device for producing an image of a layer of a body, said device comprising:

a single radiation detector situated on one side of the body;

radiation source means on a side of the body opposite to the detector, said radiation source means arranged to sequentially irradiate the body from a plurality of radiation source positions in a single plane to form a sequence of perspective images of the body on the detector, at least two of the perspective images being at least partially spatially superposed on the detector;

image recording means arranged to record the perspective images formed on the detector;

image separating means arranged between the image recording means and the detector, said image separating means separating the perspective images so that no two perspective images are superposed on the image recording means; and

means for superposing the recorded perspective images so as to construct an image of a layer of the body.

4,516,253

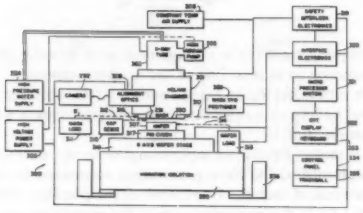
LITHOGRAPHY SYSTEM

W. Thomas Novak, San Jose, Calif., assignor to Micronix Partners, Los Gatos, Calif.

Continuation-in-part of Ser. No. 475,430, Mar. 15, 1983,. This application Apr. 25, 1983, Ser. No. 487,943

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—034 **25 Claims**



1. A lithography system for a substrate printing sequence comprising,

(a) a work station, said station including

(i) a beam chamber,

(ii) means for mounting a beam source at one end of said chamber,

(iii) means for mounting a mask at a position adjacent an opposite end of said chamber,

(iv) means for mounting image sensing means interiorly of said chamber;

(b) means for mounting in position a semiconductor substrate in contact or spaced from said mask on a side of said mask opposite said source;

(c) means for adjusting said substrate mounting means in more than three degrees of freedom in said position;

(d) means for loading a mask into said mask mounting means;

(e) means for loading a substrate onto said substrate mounting means; and

(f) means including said image sensing means for aligning the substrate and said mask.

4,516,254

X-RAY LITHOGRAPHIC APPARATUS

Yoshihiro Komeyama, Yokohama, and Motoya Taniguchi, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

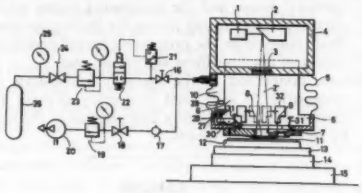
Filed Dec. 2, 1983, Ser. No. 557,460

Claims priority, application Japan, Dec. 3, 1982, 57-211407

Int. Cl.³ H01J *00/00*

U.S. Cl. 378—34 **6 Claims**

1. In an X-ray lithographic apparatus having an X-ray generator which generates X-rays, and a gastight chamber which is gastightly coupled to the X-ray generator and which holds a mask to be exposed to the X-rays, on its surface remote from the X-ray generator; an X-ray lithographic apparatus characterized in that said gastight chamber is provided with a window on which a soft member softer than the mask is mounted.



4,516,255

ROTATING ANODE FOR X-RAY TUBES

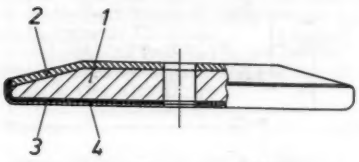
Helmut Petter, Lechaschau; Hubert Bildstein, and Fritz Simader, both of Reutte, all of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed Feb. 11, 1983, Ser. No. 465,804

Claims priority, application Austria, Feb. 18, 1982, 618/82

Int. Cl.³ H01J *35/08*

U.S. Cl. 378—143 **5 Claims**



1. A rotating anode for x-ray tubes comprising:

a basic member comprised of a carbonaceous molybdenum alloy;

a focal path member comprised of tungsten or a tungsten alloy;

a coating layer disposed on at least part of said basic member comprised of at least one oxide, or of a mixture of at least one oxide and at least one metal; and

an intermediate layer comprised of molybdenum, tungsten, or a mixture thereof, disposed between said basic member and said coating layer and being from 10 to 200 μm thick.

4,516,256

MOVABLE PROJECTOR UNIT FOR GAMMA RADIATION FOR WELDING CONTROL PURPOSES WITH PIPE-LINES AND THE LIKE

Pieter Wapperom, Rotterdam, Netherlands, assignor to Röntgen Technische Dienst B.V., Rotterdam, Netherlands

Filed Jun. 26, 1981, Ser. No. 277,805

Claims priority, application Netherlands, Jun. 27, 1980, 8003756

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—60 **7 Claims**

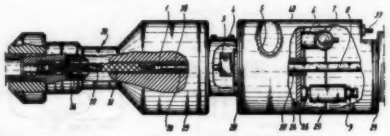
1. A movable projector device for inspecting by gamma rays a weld in a pipe-line and the like, comprising:

a motor driven carriage,

a gamma radiation projector mounted on said carriage and including a radiation source holder and a radiation source, said projector being provided with a protective housing having an axially extending channel therein for the movement of said radiation source holder,

a micro-pneumatic device coupled to said radiation source holder protective housing so as to form an integrated unit therewith, said micro-pneumatic device including a gas

supply tank containing highly pressurized gas, a piston-cylinder device, the cylinder of said piston-cylinder device extending through an axial inlet bush tube in said gas supply tank and the piston rod of said piston-cylinder device being connected to said radiation source holder, said highly pressurized gas being supplied to the cylinder of said piston-cylinder to extend said piston rod and thereby move said radiation source holder into said exposure position, said gas being exhausted on the return stroke



of said piston rod, thereby performing a self-cleaning action in said piston-cylinder device, and

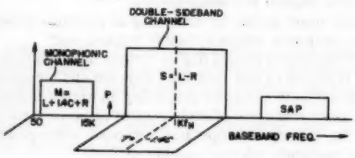
a remotely controllable electronic unit including means for receiving and processing control commands, and adapted to control selectively said carriage motor and to control selectively said micro-pneumatic device in response to said control commands, said control commands comprising pulse signals of different numbers corresponding to respective forward, stop and reverse drive commands and for radiation exposure.

4,516,257

TRIPHONIC SOUND SYSTEM

Emil L. Torick, Darien, Conn., assignor to CBS Inc., New York, N.Y.

Continuation of Ser. No. 441,571, Nov. 15, 1982, abandoned.
This application Apr. 5, 1984, Ser. No. 597,000
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—4 **17 Claims**



1. In a triphonic sound transmission system, a transmitter comprising:

means for combining three independent stereophonically related audio frequency source waves L, R and C to obtain three audio frequency signals M, S and T respectively comprising (L+1.4C+R), (L−R) and (−1.4C);

means for generating two subcarriers of the same frequency and spaced 90° apart in phase;

means for amplitude-modulating each subcarrier with a respective one of said audio frequency signals S and T to develop two double-sideband suppressed-carrier signals, the frequency of said subcarriers being sufficiently high as to assure a frequency gap between the lower sidebands of the modulated subcarrier signals and the said M signal;

means for generating a phase reference pilot signal having a frequency which is one-half the frequency of the subcarriers and lies within said frequency gap; and

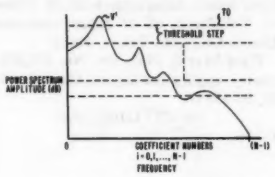
means for frequency modulating the aforementioned signals onto a high frequency carrier for the purpose of transmitting the same to one or more remote receivers.

4,516,258

BIT ALLOCATION GENERATOR FOR ADAPTIVE TRANSFORM CODER

Yau-Chau Ching, Morganville, and James D. Tomcik, Aberdeen, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 30, 1982, Ser. No. 393,690
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—31 **5 Claims**



1. Apparatus for allocating a predetermined total number of bits to a plurality of signal amplitude coefficients in an adaptive transform coding frame, each amplitude coefficient including an integer magnitude portion representation and a fractional magnitude portion representation, the apparatus comprising,

means for controllably generating an integer threshold representative of a predetermined magnitude, said integer threshold magnitude being initially adjusted during each coding frame to a predetermined maximum integer value,

means for comparing the integer magnitude representation of each of said plurality of signal amplitude coefficients to the integer threshold magnitude value,

means for allocating one bit to each of the signal amplitude coefficients having an integer magnitude which is equal to or greater than the integer threshold magnitude value,

means for controllably counting the number of bits allocated to said plurality of signal amplitude coefficients,

means responsive to the allocated bit count for controllably decreasing the integer threshold magnitude by a prescribed integer magnitude value if the allocated bit count is less than the predetermined total number of bits to be allocated after comparing all of said plurality of signal amplitude coefficient magnitudes to the integer threshold magnitude value, wherein each of said plurality of amplitude coefficient integer magnitudes is compared to said integer threshold magnitude value after each decrease in the integer threshold magnitude and one bit is added to the bits allocated to each of said plurality of amplitude coefficients having an integer magnitude which is equal to or greater than said integer threshold magnitude during each comparison cycle,

means for controllably generating a fractional threshold representative of a predetermined fractional magnitude, said fractional threshold magnitude being initially adjusted during each coding frame to a predetermined minimum fractional value,

means for comparing the fractional magnitude representations of said plurality of signal amplitude coefficients in a prescribed sequence to the fractional threshold magnitude value,

means responsive to the allocated bit count for decreasing by one bit the number of bits allocated a signal amplitude coefficient in the sequence having a fractional magnitude equal to the fractional threshold magnitude value when the allocated bit count is greater than the predetermined total number of bits to be allocated during the coding frame, and

means responsive to the allocated bit count for controllably increasing the fractional threshold magnitude by a prescribed fractional magnitude value if the allocated bit count is greater than the predetermined total number of bits to be allocated during the coding frame upon comple-

tion of the fractional threshold comparison sequence, wherein one bit is decremented from the bits allocated to each of said plurality of signal amplitude coefficients in said sequence having a fractional magnitude equal to said fractional threshold.

4,516,259

SPEECH ANALYSIS-SYNTHESIS SYSTEM

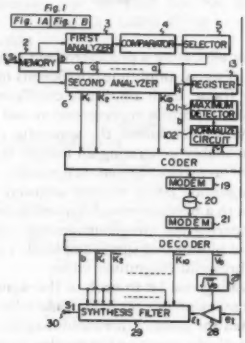
Fumihiro Yato; Seishi Kitayama, both of Tokyo, and Akira Kurematsu, Yokohama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,356

Claims priority, application Japan, May 11, 1981, 56-69388; Sep. 30, 1981, 56-153578

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—36 **4 Claims**



1. A speech analysis-synthesis system comprising:

a transmit side comprising:

(a) an input terminal for receiving an input speech signal,

(b) spectrum analysis means for analyzing said input speech signal to provide spectrum information (K_i),

(c) means for providing an average (V_0) of linear prediction error signal,

(d) means for deriving a basis period (L) of a pitch of an input speech signal,

(e) means for deriving a voiced/unvoiced decision signal V/UV according to whether an input speech signal is a voiced sound or an unvoiced sound,

(f) means for detecting a maximum level of said linear prediction error signal,

(g) means for normalizing said linear prediction error signal by dividing said signal by said maximum level to provide a pseudo exciting signal (I),

(h) a coder for coding said spectrum information, said average (V_0), said basic period (L), said voiced/unvoiced decision signal (V/UV), and said pseudo exciting signal (I) to transmit a coded speech signal,

a receive side comprising:

(i) a decoder for decoding the coded speech signal,

(j) a switch for switching a product of the pitch period (L) and said pseudo exciting signal (I), and a white noise,

(k) a synthesis filter which receives a driving signal which is obtained according to the output of said switch and said average of linear prediction error signal, and attaches correlation information to said driving signal according to said spectrum information, and

(l) an output terminal coupled with an output of said synthesis filter to provide a synthesis speech,

said pseudo exciting signal being used as an exciting signal in said receive side.

4,516,260

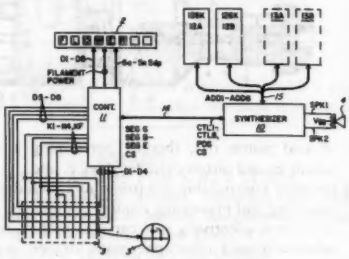
ELECTRONIC LEARNING AID OR GAME HAVING SYNTHESIZED SPEECH

Paul S. Breedlove, Plano, and James H. Moore, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 901,391, Apr. 28, 1978, abandoned. This application Aug. 29, 1980, Ser. No. 182,382

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—51 **77 Claims**



1. A talking electronic apparatus comprising:

memory means for storing digital speech data and digital control data from which a plurality of requests in synthesized human speech for respective operator responses and appropriate operator responses corresponding to said plurality of requests may be respectively derived,

speech synthesizer means operably associated with said memory means for converting said digital speech data into audible human speech,

means for randomly accessing a portion of said digital speech data stored in said memory means from which a request for an operator response may be derived,

means for transferring said randomly accessed portion of said digital speech data from said memory means to said speech synthesizer means to produce a randomly selected audible request in human speech,

operator input means for receiving an operator response to said randomly selected audible request, and

means responsive to said digital control data and said operator response to said randomly selected audible request for responding in a manner producing an output indicative of the appropriateness of said operator response with respect to the appropriate operator response corresponding to said randomly selected audible request.

4,516,261

DEVICE FOR REDUCING FAULTS IN LAYER IMAGES OF A THREE-DIMENSIONAL OBJECT FORMED BY MEANS OF PENETRATING RADIATION

Geoffrey Harding, Rellingen, and Erhard Klotz, Halstenbek, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,163

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945057

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—6 **12 Claims**

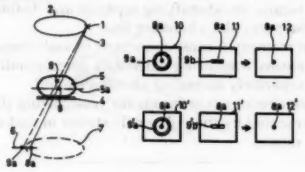
1. A method of reducing distortions in layer images comprising the steps of:

forming at least first and second groups of perspective images of the object, each perspective image being formed by irradiating the object from a given direction, the irradiation directions which correspond to perspective images in the first group being different from the irradiation directions which correspond to perspective images in the second group;

forming at least first and second layer images of a single

object layer, said first layer image being formed by superimposing the first group of perspective images, said second layer image being formed by superimposing the second group of perspective images;

analyzing information at corresponding points in the two layer images to determine whether or not those points contain corresponding information; and



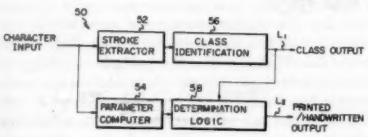
forming an ultimate corrected image of the object layer by the carrying over of information from points in the layer images which contain corresponding information and by at least partially supressing information from such points which do not contain corresponding information.

4,516,262

CHARACTER DATA PROCESSING APPARATUS

Akira Sakurai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 20, 1982, Ser. No. 410,119
Claims priority, application Japan, Aug. 31, 1981, 56-136480
Int. Cl.³ G06K *9/46*
U.S. Cl. 382—18 **8 Claims**



1. A character data processing apparatus comprising:

a scanning means for scanning an original document carrying handwritten character data to produce electric image data;

character extraction means for extracting each character from the image data;

character identification means for identifying the characteristics of the extracted character; and

character processing means for processing the identified character into printed character data;

the character identification means comprising a character shape detector for detecting the shape of the extracted character which is one of a plurality of shapes;

the character shape detector comprising a character stroke extractor for extracting the number of strokes of the extracted character, and a character shape estimater for estimating the shape of the extracted character depending on the extracted number of strokes.

4,516,263

SPATIALLY INTEGRAL, VIDEO SIGNAL PROCESSOR

Brock S. Dew, Newton, and Paul Greiff, Wayland, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 30, 1982, Ser. No. 373,620
Int. Cl.³ G06K *9/00;* **H03H** *15/02;* **G11C** *19/14;* **H01L** *27/00*
U.S. Cl. 382—41 **25 Claims**

1. A spatially integral video signal processor unit comprising:

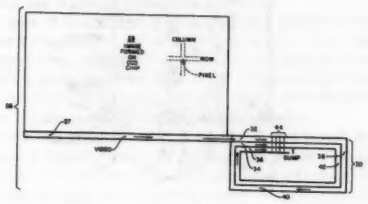
a unitary substrate;

a plurality of signal transfer channels for transferring video signals originating from detection of an optical image along said substrate;

means for applying said video signaLs to one of said signal transfer channels;

said plurality of channels being adjacent each other on said substrate and divided into individual signal storage elements;

said signal storage elements adapted to transfer the signal stored thereby from element to element along each channel;



said substrate further including means for applying the output of one channel after suitable delay to the input of an adjacent channel to define a single elongated signal path through said plurality of signal transfer channels during application of said video signals to said one of said signal transfer channels whereby the signaLs stored in said plural adjacent channels represent the detected optical image in original two-dimensional relationship;

means on said substrate for developing a signal representative of a predetermined function of at least a portion of the signals stored in adjacent elements of adjacent channels in real time during application of said video signals.

4,516,264

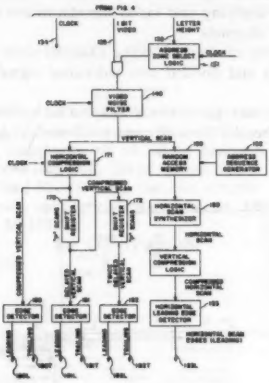
APPARATUS AND PROCESS FOR SCANNING AND ANALYZING MAIL INFORMATION

John Corvari; Joseph Ulvr, and Raigo Alas, all of Guelph, Canada, assignors to United States of America Postal Service, Washington, D.C.

Continuation of Ser. No. 343,727, Jan. 29, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 644,153
Int. Cl.³ G06K *9/36*
U.S. Cl. 382—46 **19 Claims**

1. An apparatus for evaluating information on a surface of an object being transported past a fixed point comprising: means for sensing the presence of said object in said apparatus to enable scanning of said surface, means enabled by said sensing means for scanning said surface due to movement of said object past said sensing means, means for receiving signals from said scanning means and for generating first serial streams of data representing successive lines of information on said object in one direction of scan, means for disposing bit of said first serial streams in a different order to provide a second serial data stream representing scan results from successive lines of information for only a direction orthogonally related to said one direction, and means coupled to said means for receiving and

generating and said means for disposing responsive to said first data streams directly and said second data stream to determine



characteristics of said information on said surface of said object.

4,516,265

OPTICAL CHARACTER READER

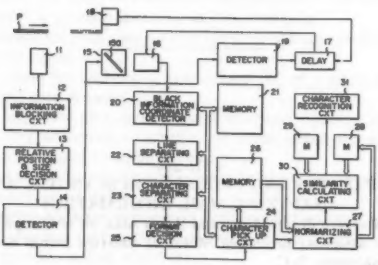
Shuji Kizu, Yokohama; Tsutomu Ikeda, and Masanori Iwamoto, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 242,565, Mar. 11, 1981, abandoned. This application Apr. 5, 1982, Ser. No. 365,385

Claims priority, application Japan, Mar. 14, 1980, 55-32300; European Pat. Off., Mar. 6, 1981, 81101659.1

Int. Cl.[3] **G06K** *9/20, 9/00*

U.S. Cl. 382—48 **5 Claims**



1. An optical character reader for reading information from an object comprising:

a pre-scanner for coarsely scanning a surface of the object on which the information to be read appears and generating first video signals indicative thereof;

blocking means for processing the first video signal to identify a plurality of separate and distinct blocks of information;

coordinate data means, connected to said blocking means, for determining a coordinate of a particular block from among the blocks identified by said blocking means to produce coordinate data;

a main scanner, connected to said coordinate data means, for finely scanning the particular block identified by the coordinate data and generating second video signals indicative thereof;

first memory means for storing video data corresponding to the second video signals;

line separating means, connected to said first memory means, for processing the video signals data to separate the particular block into a plurality of character lines and deriving a video data component corresponding to a particular character line including one or more characters from the second video signals data;

character separating means, connected to said line separating means, for identifying separate and distinct characters of the particular character line;

second memory means, connected to said character separating means, for storing video data corresponding to each of the separately identified characters; and

character recognition means for recognizing the characters represented by the video data stored in said second memory means.

4,516,266

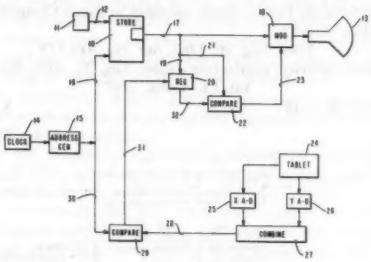
ENTITY CONTROL FOR RASTER DISPLAYS

Robert J. Christopher, Underhill, and Robert F. Walker, Hinesburg, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1982, Ser. No. 450,577

Int. Cl.[3] **G06F** *3/14;* **G06K** *9/00*

U.S. Cl. 382—48 **8 Claims**



1. Apparatus for carrying out displayed feature detection and verification in a raster system including,

a store for items of data,

display means for serially receiving incoming items of data from said store, and forming an image therefrom,

each item of data being used to form a part of a feature of the image and being provided with an identifying signal associated with the feature formed in part by said item,

input means for generating signals, each representing the coordinates of a selected point in the feature formed in part by said item,

first comparison means for comparing the signal representing the coordinates of the selected point with the incoming items of data from the store to indicate if a correlation exists, and providing a loading signal if such correlation exists,

register means for receiving the loading signal of said first comparison means, and in response to the loading signal storing the identifying signal of the item of data so compared,

second comparison means for comparing the stored identifying signal with the identifying signal of the serially received items of data from said store, and

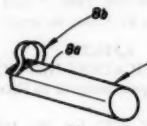
means coupled to the second comparison means, for emphasizing the feaure of the image correlated with the selected point,

said second comparison means providing a signal to said emphasizing means for emphasizing the feature when a correlation occurs between the stored identifying signal and the identifying signal of the received items of data from the store.

4,516,267
HANG BAG

Garnet J. Kent, Mississauga, and John C. Wood, Milton, both of Canada, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 358,503, Mar. 15, 1982,. This application Aug. 1, 1983, Ser. No. 518,894
Int. Cl.³ B65D *30/00*
U.S. Cl. 383—22 **1 Claim**

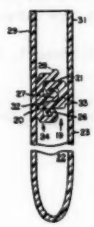


1. A hang bag comprising:
(a) a bag portion including:
(i) front and back panels of heat shrinkable, thermoplastic sheet material;
(ii) said panels comprising a single sheet folded so that the fold comprises the bottom of the bag and,
(iii) each side of said front and back panels being sealed to the corresponding side of the panels along their side edges in parallel side seals leaving the top side unsealed thereby defining the mouth of the bag for loading a product into the bag; and,
(b) a single strap of non-heat shrinkable, sealable material, one end of said strap being sealed to one side seal and the other end to the other side seal;
(c) a heat shrinkable strap each end of which is sealed in an opposite side seal of said bag, said strap being shrunken with said bag, said non-heat shrinkable strap of thermoplastic material being superimposed over said shrinkable strap, one end of said strap being sealed to one side seal and the other end of said strap to the other side seal thus providing a hang loop for said bag, the respective ends of said non-shrinkable strap and said shrinkable strap being sealed together at a side seal. whereby when said bag is heated and shrunk the heat shrinkable strap shrinks with the bag and remains in contact therewith, said shrinkable bag and strap shrinking away from the non-shrinkable strap which remains unshrunken and provides a hang loop.

4,516,268
PENTABAR CLOSURE DEVICE

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 400,114, Jul. 20, 1982, abandoned, which is a continuation of Ser. No. 972,428, Dec. 22, 1978, abandoned. This application Jul. 29, 1983, Ser. No. 518,537
Int. Cl.³ A44B *17/00, 19/00*
U.S. Cl. 383—63 **8 Claims**

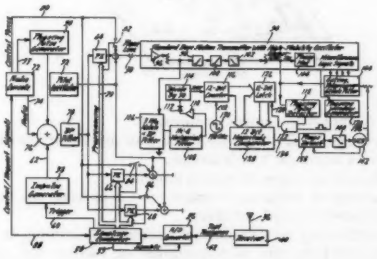


1. A container comprising a flexible closure device and a pouch portion including two side walls and two side edges;
said closure device comprising first and second flexible closure strips arranged in confronting relationship to each other and permanently connected to each other at the two side edges;
said first closure strip having two opposite sides, one side of said first closure strip is generally flat and connected to one side wall of said pouch portion and the other side of said first closure strip consists of a pair of first hooks;
each of said first hooks extending in the direction of the interior of said pouch portion;
said second closure strip having two opposite sides, one side of said second closure strip is generally flat and connected to the other side wall of said pouch portion and the other side of said second closure strip consists of a ridge and a pair of second hooks;
each of said second hooks extending in a direction away from the interior of said pouch portion;
said pairs of first and second hooks being operable for resiliently engaging and disengaging with each other and said ridge being positioned on the side of said pair of second hooks away from the interior of said pouch portion and being operable to guide said first and second closure strips for occlusion and to maintain the occlusion;
wherein the hooks near the interior of said pouch portion have a negative angle of engagement when said closure device is occluded, and wherein the hooks distal to said pouch portion have a positive angle of engagement when said closure device is occluded.

4,516,269
AUTOMATIC EQUALIZATION FOR A SIMULCAST COMMUNICATION SYSTEM

Jerome V. Krinock, Detroit, Mich., assignor to Michigan Consolidated Gas Company, Detroit, Mich.

Filed Dec. 10, 1982, Ser. No. 448,830
Int. Cl.³ H04B *3/50, 1/62, 3/04, 17/02*
U.S. Cl. 455—51 **21 Claims**



20. A method of generating a synchronized squelch signal to be simultaneously broadcasted from a plurality of base stations in a communication system where an audio signal is transmitted from a dispatch station to each of said base stations along telephone lines, comprising the steps of:
generating a pilot signal and transmitting said pilot signal to each of said base stations with said audio signal;
generating a phasing signal and transmitting said phasing signal to each of said base stations at the beginning of said audio signal; and
generating a substantially synchronized squelch signal at each of said base stations in response to said pilot and phasing signals.

4,516,270
MICROWAVE RECEIVER FRONT END DESIGN

James P. Phillips, Lake in the Hills, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

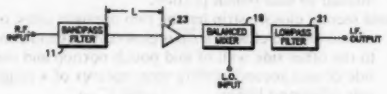
Filed Mar. 2, 1983, Ser. No. 471,418
Int. Cl.³ H04B *1/10, 1/26*
U.S. Cl. 455—302 **3 Claims**

3. A method for receiving and processing communications

signals comprising a desired frequency signal and an undesired image frequency signal, the method comprising the steps of;

(a) filtering said desired frequency from said communications signal with a filtering means,

(b) transmitting said desired frequency over a transmission medium which has a length L equal to $\eta\pi/\beta$ where η



equals an integer and β is proportional to the wavelength of the image frequency,

(c) low noise amplifying said desired frequency while impedance matching with said transmission medium,

(d) mixing said desired frequency with a local oscillator frequency to produce an information signal.

4,516,271

MICROWAVE MIXER WITH RECOVERY OF THE SUM FREQUENCY

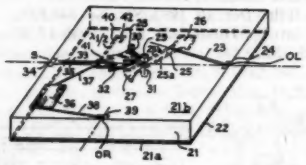
Pierre Fraise, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 11, 1983, Ser. No. 522,212

Claims priority, application France, Aug. 20, 1982, 82 14435

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—327 **10 Claims**



1. A microwave mixer comprising:

a microelectronic circuit having at least one electronic element with a nonlinear characteristic,

a substrate for supporting said circuit,

a plurality of striplines coupled to said at least one element supported by said substrate,

a closed casing surrounding said circuit and forming an internal cavity thereby, said casing having thereon first, second and third terminals,

said first terminal accepting an incident wave of frequency Fs,

said second terminal accepting a mixing wave of frequency F_L and said third terminal providing a mixed output wave having a frequency Fo,

tuning means coupled to said casing to tune said internal cavity to a sum frequency $Fs+F_L$ representing the sum of the frequency of the mixing wave F_L and of the frequency of the incident wave Fs.

4,516,272

COMMUNICATION NETWORK

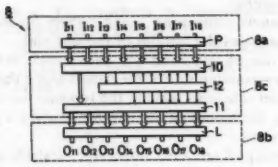
Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 15, 1983, Ser. No. 466,504

Claims priority, application Japan, Feb. 15, 1982, 57-21312

Int. Cl.³ H04B *9/00*

U.S. Cl. 455—607 **19 Claims**



15. A node for use in a communication network as connected to one or more other nodes and/or terminals of various peripheral devices, comprising:

a plurality of input channels;

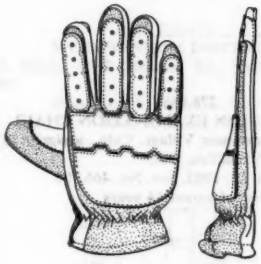
a like plurality of output channels, each of which corresponds to one of said plurality of input channels thereby forming a like plurality of input-output channel pairs; and

connection control means for scanning said input channels for receipt of an input signal and for controlling a connection ondition between said plurality of input and output channels, wherein said connection control means stores information to flag which one of said plurality of input channels has received an input signal, without inspecting the contents thereof, for a predetermined time period from reception of said input signal or until reception of another input signal by another of said input channels within said predetermined time period, and thereupon causes said other input signal to be supplied as an output signal to an output channel corresponding to said flagged one input channel.

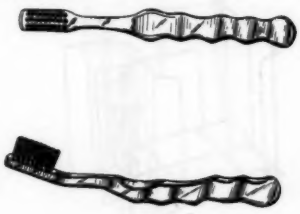
DESIGNS

MAY 7, 1985

278,660
GLOVE
Geoffrey T. Fox, San Jose, Calif., assignor to Moto-X Fox, Inc., Campbell, Calif.
Filed Dec. 7, 1982, Ser. No. 447,751
Term of patent 14 years
U.S. Cl. D2—373

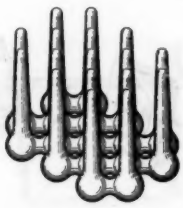


278,661
CHILDREN'S TOOTH BRUSH
Ralf Gelsen, Rotenburg-Unterstedt, Fed. Rep. of Germany, assignor to MAPA GmbH Gummi- und Plastikwerke, Zeven, Fed. Rep. of Germany
Filed May 10, 1983, Ser. No. 493,303
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, MR 18
Term of patent 14 years
U.S. Cl. D4—104

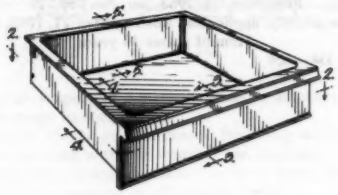


278,662
TOOTHBRUSH
Andreas Fay, Vienna, Austria, assignor to Lever Brothers Company, New York, N.Y.
Filed Nov. 28, 1983, Ser. No. 555,729
Claims priority, application Austria, May 27, 1983, 529643
Term of patent 14 years
U.S. Cl. D4—104

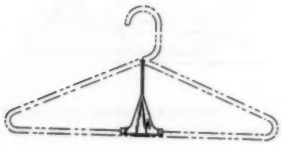
278,663
MAGAZINE RACK
Walter Zeischegg, deceased, late of Ulm, Fed. Rep. of Germany; by Rosalinde Zeischegg, heiress, Blumenscheinweg 10, Ulm, and Bernd Brüssing, Bilharzstr. 3, Ulm-Lehr, both of Fed. Rep. of Germany D-7900
Filed Aug. 24, 1982, Ser. No. 411,231
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, MR 954; France, Mar. 16, 1982, DM-001299
Term of patent 14 years
U.S. Cl. D6—476



278,664
DRAWER
Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Oct. 18, 1982, Ser. No. 435,101
Term of patent 14 years
U.S. Cl. D6—510



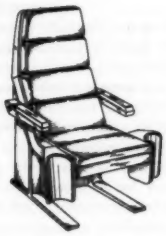
278,665
RETAINER ACCESSORY FOR GARMENT HANGERS
Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205
Filed Sep. 30, 1982, Ser. No. 430,266
Term of patent 14 years
U.S. Cl. D6—328



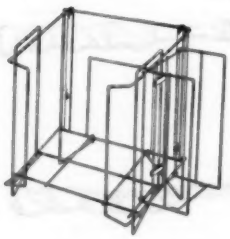
278,666
COMBINED PICTURE FRAME AND PHOTOGRAPH ALBUM
Gerald S. McCartin, Van Nuys, Calif., assignor to Sunset Time, Inc., Mission Hills, Calif.
Filed Jul. 15, 1983, Ser. No. 514,009
Term of patent 14 years
U.S. Cl. D6—300

278,667
A PORTABLE SEAT FOR USE IN TRANSPORTING AN INDIVIDUAL
Alvin M. Jacobson, Rte. 1, Box 67, Ostrander, Minn. 55961
Filed Mar. 10, 1983, Ser. No. 474,122
Term of patent 14 years
U.S. Cl. D6—334

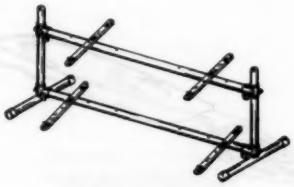
278,668
MULTI-POSITION EXAMINATION CHAIR
Terry J. Simpkins, Snowmass Village, Colo., assignor to Midmark Corporation, Versailles, Ohio
Filed Feb. 15, 1983, Ser. No. 466,705
Term of patent 14 years
U.S. Cl. D6—335



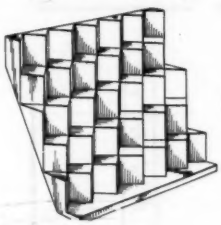
278,669
PILLOW RACK
Arline Walpin, 9400 Brighton Way, Beverly Hills, Calif. 90210
Filed Aug. 17, 1982, Ser. No. 408,803
Term of patent 14 years
U.S. Cl. D6—462



278,670
KEYBOARD STACKER
Darrell A. Schoenig, 432 Clover La., Ft. Collins, Colo. 80521
Filed Dec. 9, 1982, Ser. No. 448,268
Term of patent 14 years
U.S. Cl. D6—463



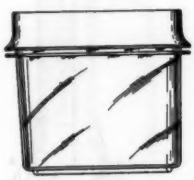
278,671
MERCHANDISE DISPLAY RACK
Hal D. Sandy, 4937 Glendale Rd., Shawnee Mission, Kans. 66205
Filed Nov. 8, 1982, Ser. No. 440,017
Term of patent 14 years
U.S. Cl. D6—474



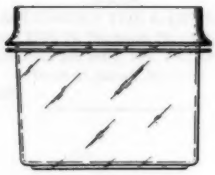
278,672
CHAMPAGNE GLASS
Ben Seibel, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jul. 29, 1982, Ser. No. 403,144
The portion of the term of this patent subsequent to Apr. 9, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

278,673
BOTTLE COOLER
David E. Decker, Tujunga, Calif., assignor to Charles E. Da Mart, Studio City, Calif.
Filed Feb. 16, 1982, Ser. No. 349,065
Term of patent 14 years
U.S. Cl. D7—77

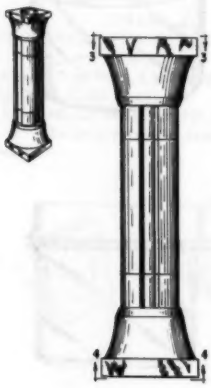
278,674
FOOD SAVER
Pierre Tardif, and Yvan Laporte, both of, Vieux Montreal, Canada, assignors to Les Produits Menagers Coronet (1980) Inc., St. Hyacinthe, Canada
Filed Jun. 21, 1982, Ser. No. 390,557
Claims priority, application Canada, Feb. 25, 1982, 25-02-82-12
Term of patent 14 years
U.S. Cl. D7—79



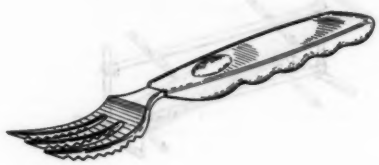
278,675
FOOD SAVER
Pierre Tardif, and Yvan Laporte, both of Vieux, Montreal, Canada, assignors to Les Produits Menagers Coronet (1980) Inc., St. Hyacinthe, Canada
Filed Jun. 21, 1982, Ser. No. 390,669
Claims priority, application Canada, Feb. 25, 1982, 25-02-82-11
Term of patent 14 years
U.S. Cl. D7—79



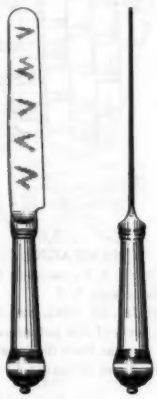
278,676
CAKE SUPPORT PILLAR
David W. DeAre, Glen Ellyn, Ill., assignor to Wilton Enterprises, Inc., Woodridge, Ill.
Filed Aug. 23, 1982, Ser. No. 409,581
Term of patent 14 years
U.S. Cl. D7—83



278,677
FOOD MASHING TOOL
Mildred Zimetbaum, 19 McClellan Ter., West Orange, N.J. 07052
Filed Sep. 27, 1982, Ser. No. 424,027
Term of patent 14 years
U.S. Cl. D7—101

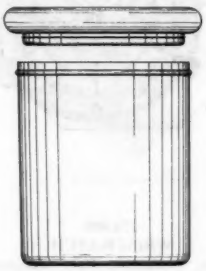


278,678
KNIFE
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Sep. 15, 1982, Ser. No. 418,469
Term of patent 14 years
U.S. Cl. D7—137

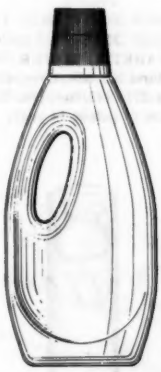


278,679
MOUNTING CLIP
Jesus R. Villanueva, Justice, Ill., assignor to The Cooperative Marketing Co., Elk Grove Village, Ill.
Filed Jul. 20, 1982, Ser. No. 400,098
Term of patent 14 years
U.S. Cl. D8—373

278,680
COMBINED PACKAGING CONTAINER AND COVER WITH A CROWNED BEAD
Silvio Guzzini, Recanati, Italy, assignor to F. Lli Guzzini S.p.A., Recanati, Italy
Filed Feb. 8, 1982, Ser. No. 347,024
Term of patent 14 years
U.S. Cl. D9—352



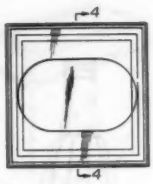
278,681
BOTTLE
Harald Prahs, Hamburg-Wentorf, Fed. Rep. of Germany, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Sep. 14, 1982, Ser. No. 417,893
Term of patent 14 years
U.S. Cl. D9—378



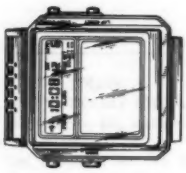
278,682
BOTTLE
Gérard Khalifa, Marseille, France, assignor to Societe Internationale De Boissons. Aubagne, France
Filed Jul. 12, 1982, Ser. No. 397,019
Claims priority, application France, Jan. 12, 1982, 820,074
Term of patent 14 years
U.S. Cl. D9—398

278,683
BOTTLE
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics & Glass Company, Inc., Boyertown, Pa.
Filed May 13, 1982, Ser. No. 377,638
Term of patent 14 years
U.S. Cl. D9—410

278,684
TELESCOPING DISPENSER FOR COTTON BALLS OR THE LIKE
Howard Sussman, c/o F. F. Adams, Inc., 700 NW. 8th Ave., Fort Lauderdale, Fla. 33311
Filed Nov. 2, 1981, Ser. No. 317,272
Term of patent 14 years
U.S. Cl. D9—339

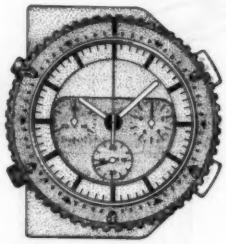


278,685
WATCH
Susumu Suzuki; Noritaka Uchihori, and Naoto Fukasawa, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Dec. 14, 1982, Ser. No. 449,815
Claims priority, application Japan, Jun. 15, 1982, 57-26705
Term of patent 14 years
U.S. Cl. D10—38

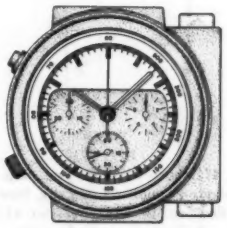


278,686
WATCH
Fredy Mathez, Tramelan, Switzerland, assignor to Paul Virgile Mathez, S.A., Tramelan, Switzerland
Filed Dec. 6, 1982, Ser. No. 447,680
Claims priority, application Hague, Jun. 7, 1982, 72,433
Term of patent 14 years
U.S. Cl. D10—39

278,687
WRISTWATCH
Giorgetto Giugiaro, Trofarello, Italy, assignor to Kabushiki Kaisha Hattori Seiko, Tokyo, Japan
Filed Jun. 29, 1983, Ser. No. 509,169
Claims priority, application Japan, Jan. 20, 1983, 58-1955
Term of patent 14 years
U.S. Cl. D10—39

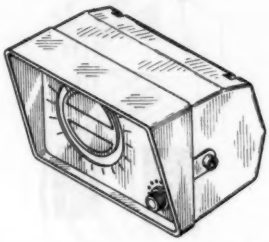


278,688
WRISTWATCH
Giorgetto Giugiaro, Trofarello, Italy, assignor to Kabushiki Kisha Hattori Seiko, Tokyo, Japan
Filed Jun. 21, 1983, Ser. No. 506,338
Claims priority, application Japan, Dec. 21, 1982, 57-261
Term of patent 14 years
U.S. Cl. D10—39

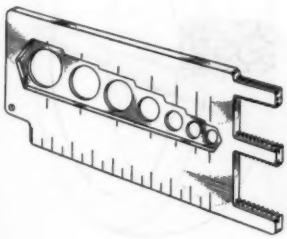


278,689
PARKING METER
Carlen R. Jupe, 1270 First St., Monterey, Calif. 93940
Filed May 27, 1982, Ser. No. 382,635
Term of patent 14 years
U.S. Cl. D10—42

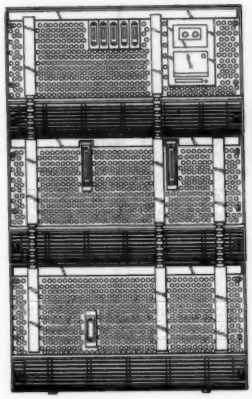
278,690
HOUSING FOR SONAR UNIT
David B. Steensland, and William E. McBride, both of Tulsa, Okla., assignors to Lowrance Electronics, Inc., Tulsa, Okla.
Filed Aug. 9, 1982, Ser. No. 406,702
Term of patent 14 years
U.S. Cl. D10—46



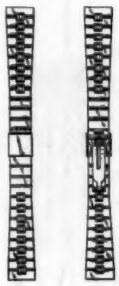
278,691
BOLT, NUT, SCREW AND THREAD GAGE
John E. Sorrell, Toluca Lake, Calif., assignor to Sonia Sorrell, Toluca Lake, Calif.
Filed May 25, 1982, Ser. No. 382,227
Term of patent 14 years
U.S. Cl. D10—64



278,692
CIRCUIT BOARD TESTING EQUIPMENT
Kurt Groetzner, Stuttgart, and Bert Wurst, Möglingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 19, 1982, Ser. No. 340,791
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 5331
Term of patent 14 years
U.S. Cl. D10—75



278,693
WATCH BRACELET
Alain-Dominique Perrin, Rueil-Malmaison, France, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Oct. 6, 1982, Ser. No. 433,095
Claims priority, application France, Apr. 6, 1982, 821203; Apr. 16, 1982, 821342
Term of patent 14 years
U.S. Cl. D11—19

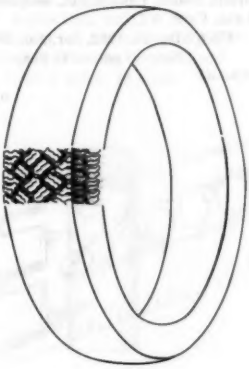


278,694
WINDOW JEWEL
Julia Andrus, Salt Lake City, Utah, assignor to Authentica, Inc., Salt Lake City, Utah
Filed Nov. 10, 1982, Ser. No. 440,460
Term of patent 14 years
U.S. Cl. D11—117

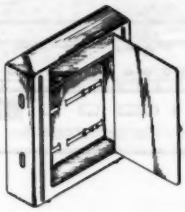
278,695
WINDOW JEWEL
Julia Andrus, Salt Lake City, Utah, assignor to Authentica, Inc., Salt Lake City, Utah
Filed Nov. 10, 1982, Ser. No. 440,581
Term of patent 14 years
U.S. Cl. D11—117

278,696
VEHICLE TIRE
Hubert Grohmann, and Halvard Nilsson, both of Gislaved, Sweden, assignors to Gislaved Aktiebolag, Gislaved, Sweden
Filed Oct. 18, 1983, Ser. No. 543,098
Claims priority, application Sweden, Apr. 18, 1983, 83-1088
Term of patent 14 years
U.S. Cl. D12—147

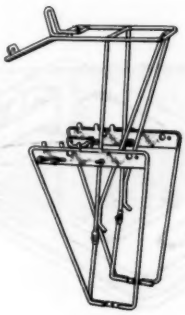
278,697
PNEUMATIC TIRE TREAD AND BUTTRESS
John A. Hutz, Orchard Lake, Mich., assignor to Uniroyal, Inc., Middlebury, Conn.
Filed Jul. 5, 1983, Ser. No. 510,795
Term of patent 14 years
U.S. Cl. D12—151



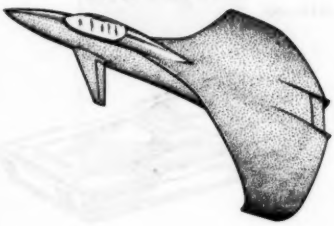
278,698
CAR TOP CARRIER FOR CLOTHING ARTICLES, CARGO AND THE LIKE
William K. Borden, 211 Savannah Dr., Nicholasville, Ky. 40356
Filed Sep. 30, 1982, Ser. No. 432,127
Term of patent 14 years
U.S. Cl. D12—157



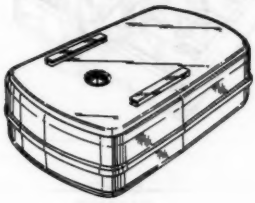
278,699
PANNIER CARRIER FOR THE FRONT WHEEL OF A BICYCLE
James R. Blackburn, 303 Casitas Bulevar, Los Gatos, Calif. 95030
Filed May 15, 1981, Ser. No. 263,777
Term of patent 14 years
U.S. Cl. D12—158



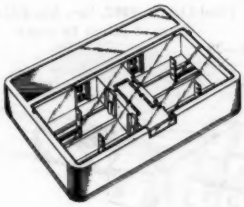
278,700
AIRCRAFT
Sidney A. Powers, Fort Salonga; Gordon Rosenthal, Jericho, and William V. Stirling, Huntington, all of N.Y., assignors to Fairchild Industries, Inc., Chantilly, Va.
Filed Nov. 3, 1983, Ser. No. 548,460
Term of patent 14 years
U.S. Cl. D12—342



278,701
ROTATOR PRIMARILY FOR A BARBECUE SPIT
Clement S. Wan, Hong Kong, Hong Kong, assignor to Landmann Limited, Kowloon, Hong Kong
Filed Feb. 26, 1982, Ser. No. 352,610
Claims priority, application United Kingdom, Sep. 9, 1981, 1002392
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—2



278,702
MULTIPLE BATTERY CHARGER
Daniel J. Chiodo, Miami; Barry Pardon, Tamarac, and Joseph Verga, Miami Lakes, all of Fla., assignors to General Electric Company, Gainesville, Fla.
Filed Jan. 28, 1983, Ser. No. 461,769
Term of patent 14 years
U.S. Cl. D13—5



278,703

MULTIPLE BATTERY CHARGER

Daniel J. Chiodo, Miami; Barry Pardon, Tamarac, and Joseph Verga, Miami Lakes, all of Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Jan. 28, 1983, Ser. No. 461,771

Term of patent 14 years

U.S. Cl. D13—5

278,704

MULTIPLE BATTERY CHARGING UNIT OR SIMILAR ARTICLE

Bruce A. Claxton, Coral Springs, Fla., and Sylvia Ramos, Royal Oak, Mich., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 22, 1983, Ser. No. 525,085

Term of patent 14 years

U.S. Cl. D13—5

278,705

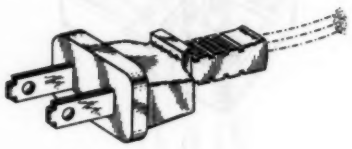
TWO-PRONG ELECTRIC PLUG

Petrus J. J. Nagelkerke, and Klaas T. Oord, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1982, Ser. No. 432,627

Term of patent 14 years

U.S. Cl. D13—28



278,706

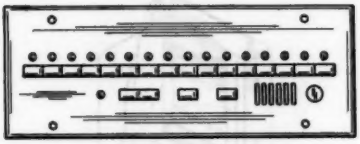
POWER CONTROL PANEL

Hiroshi Yamagata, and Kendo Makihara, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

Filed Aug. 10, 1983, Ser. No. 522,192

Term of patent 14 years

U.S. Cl. D13—35



278,707

CASING FOR VOICE SYNTHESIZER

Robert S. Swinney, Glendale, Calif., assignor to Robert Swinney Ltd., Glendale, Calif.

Filed Feb. 28, 1983, Ser. No. 470,279

Term of patent 14 years

U.S. Cl. D14—1

278,708

TELEPHONE CRADLE OR SIMILAR ARTICLE

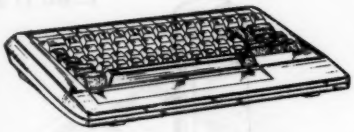
Terrance N. Taylor, Cary, and Leonid Soren, Lincolnwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 19, 1983, Ser. No. 459,278

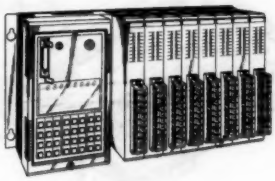
Term of patent 14 years

U.S. Cl. D14—60

278,709
KEYBOARD FOR A COMPUTER SYSTEM
Eric G. Xanthopoulus, San Jose, Calif., assignor to Cromemco Inc., Calif.
Filed Nov. 2, 1982, Ser. No. 438,480
Term of patent 14 years
U.S. Cl. D14—100

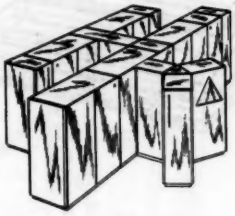


278,710
PROGRAMMABLE CONTROLLER
Norio Shimizu; Yuichi Watanabe, and Kiichi Naoi, all of Tokyo, Japan, assignors to Koyo Electronics Industries Co., Ltd., Tokyo, Japan
Filed Dec. 30, 1982, Ser. No. 454,755
Term of patent 14 years
U.S. Cl. D14—100

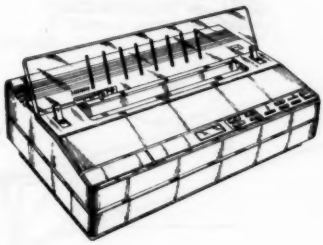


278,711
COMPUTER HOUSING
Randall S. Duell, Batavia; Steven H. Kulpa, Aurora, both of Ill.; Justin M. Maguire, Jr., Barrington, R.I.; Alan C. Schoneck, Wheaton, Ill., and Gordon E. Sylvester, Jamaica, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 23, 1982, Ser. No. 422,206
Term of patent 14 years
U.S. Cl. D14—102

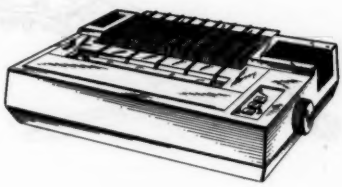
278,712
CENTRAL PROCESSOR UNIT
Koushirou Adachi, Tokorozawa; Katsuhiko Nishiwaki, Higashimurayama; Motoake Sakamoto, Tanashi; Tamotsu Tsukaguchi, Hiratsukashi, and Mitsuo Miyamoto, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 26, 1982, Ser. No. 444,707
Claims priority, application Japan, Jun. 21, 1982, 57-27339
Term of patent 14 years
U.S. Cl. D14—102



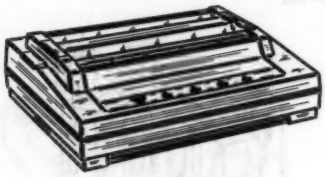
278,713
PRINTER
Vincent A. Juliana, Exton, Pa., assignor to Exxon Research and Engineering Co., Florham Park, N.J.
Filed Sep. 30, 1982, Ser. No. 429,149
Term of patent 14 years
U.S. Cl. D14—111



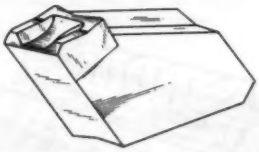
278,714
ELECTRONIC PRINTER
Naoyuki Maruyama, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha and Epson Corp., both of Tokyo, Japan
Filed Dec. 2, 1982, Ser. No. 446,118
Claims priority, application Japan, Jun. 4, 1982, 57-24662
Term of patent 14 years
U.S. Cl. D14—111



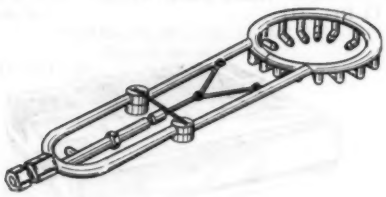
278,715
INK JET PRINTER
Katsuhiro Ishida, and Harumi Sakamoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 23, 1982, Ser. No. 452,838
Claims priority, application Japan, Jul. 5, 1982, 57-30409
Term of patent 14 years
U.S. Cl. D14—111



278,716
CUTTING INSERT FOR METAL WORKING MACHINES
Joseph Pano, Nahariya, Israel, assignor to Iscar Ltd., Nahariya, Israel
Filed Jul. 9, 1981, Ser. No. 281,550
Claims priority, application Israel, Jan. 21, 1981, 8420
Term of patent 14 years
U.S. Cl. D15—139



278,717
PRESSURE WELDING BURNER
Kokichi Ichikawa, 1-27 Heian-cho, Tsurumi-ku, Yokohama 230, Japan
Filed Sep. 22, 1982, Ser. No. 421,524
Term of patent 14 years
U.S. Cl. D15—144



278,718
PIANO WIRE DAMPER
Jerry McKibben, Seneca, S.C., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Mar. 1, 1983, Ser. No. 471,195
Term of patent 14 years
U.S. Cl. D17—9

278,719
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,311
Claims priority, application Japan, Jan. 11, 1983, 58-507
Term of patent 14 years
U.S. Cl. D18—1

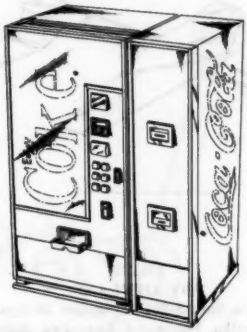
278,720
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,313
Claims priority, application Japan, Jan. 11, 1983, 58-513
Term of patent 14 years
U.S. Cl. D18—1

278,721
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,324
Claims priority, application Japan, Jan. 11, 1983, 58-510
Term of patent 14 years
U.S. Cl. D18—1

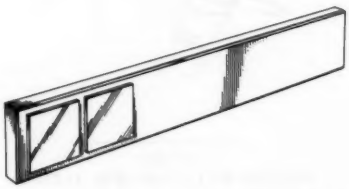
278,722
CHILDREN'S BOOK
James F. Becker, 3008 3rd St. - Apt. A, and Andrew S. Mayer, 706-½ Ashland Ave, both of Santa Monica, Calif. 90405
Filed Jul. 12, 1982, Ser. No. 397,290
Term of patent 14 years
U.S. Cl. D19—28

278,723
APPOINTMENT MEMO HOLDER
James R. Dunn, Fairfield, Conn., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 20, 1983, Ser. No. 459,698
Term of patent 14 years
U.S. Cl. D19—91

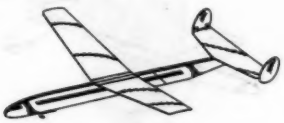
278,724
VENDING MACHINE
G. Merle Bachmann, Stone Mountain; Charles L. Davis, Atlanta; Annis R. Morgan, Jr., Atlanta; Walter L. Shelton, Atlanta, and Robert D. Hughes, IV, Smyrna, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 236,182, Feb. 20, 1981, Pat. No. Des. 266,337. This application Jun. 14, 1982, Ser. No. 388,442
Term of patent 14 years
U.S. Cl. D20—4



278,725
SIGN BOARD
Lee R. Caroselli, Box 842, Vail, Colo. 81657
Continuation of Ser. No. 930,733, Aug. 3, 1978,. This application Dec. 5, 1980, Ser. No. 213,253
Term of patent 14 years
U.S. Cl. D20—42

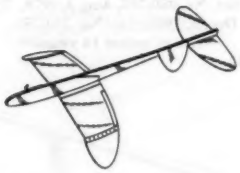


278,726
TOY AIRPLANE
Yasuaki Ninomiya, Suite 5-101 Tamaplaza, 20 Utsukushigaoka, 1-chome, Midoriku, Yokohama, Kanagawa, Japan
Filed Nov. 15, 1982, Ser. No. 441,508
Claims priority, application Japan, May 28, 1982, 57-23519
Term of patent 14 years
U.S. Cl. D21—89



278,727
TOY AIRPLANE
Yasuaki Ninomiya, Suite 5-101 Tamaplaza, 20 Utsukushigaoka, 1-chome, Midoriku, Yokohama, Kanagawa, Japan
Filed Nov. 15, 1982, Ser. No. 441,510
Claims priority, application Japan, May 28, 1982, 57-23518
Term of patent 14 years
U.S. Cl. D21—89

278,728
TOY AIRPLANE
Yasuaki Ninomiya, Suite 5-101 Tamaplaza, 20 Utsukushigaoka, 1-chome, Midoriku, Yokohama, Kanagawa, Japan
Filed Nov. 15, 1982, Ser. No. 441,649
Claims priority, application Japan, May 31, 1982, 57-23960
Term of patent 14 years
U.S. Cl. D21—89

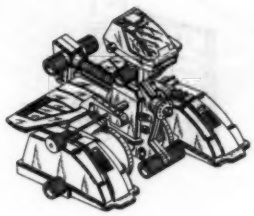


278,729
TOY AIRPLANE
Yasuaki Ninomiya, Suite 5-101 Tamaplaza, 20 Utsukushigaoka, 1-chome, Midoriku, Yokohama, Kanagawa, Japan
Filed Nov. 15, 1982, Ser. No. 441,650
Claims priority, application Japan, May 28, 1982, 57-23521
Term of patent 14 years
U.S. Cl. D21—89

278,730
TOY AIRPLANE
Yasuaki Ninomiya, Suite 5-101 Tamaplaza, 20 Utsukushigaoka, 1-chome, Midoriku, Yokohama, Kanagawa, Japan
Filed Nov. 15, 1982, Ser. No. 441,651
Claims priority, application Japan, May 31, 1982, 57-23959
Term of patent 14 years
U.S. Cl. D21—89

278,731
INFLATABLE PLUSH TOY FIGURES
Timothy J. Cohorst, P.O. Box 2868, Arnold, Calif. 95223, and Ruth R. Haupt, 2620 Echo Ave., Bakersfield, Calif. 93304
Filed Dec. 8, 1982, Ser. No. 432,656
Term of patent 14 years
U.S. Cl. D21—148

278,732
ANIMAL-LIKE FIGURE TOY
Tethuo Ohkado, Tokyo, Japan, assignor to Tomy Kogyo Company, Incorporated, Japan
Filed Aug. 13, 1982, Ser. No. 407,740
Claims priority, application Japan, Aug. 25, 1981, 56-37330
Term of patent 14 years
U.S. Cl. D21—150

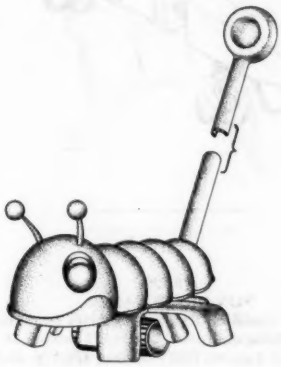


278,733
ANIMAL-LIKE FIGURE TOY
Tethuo Ohkado, Tokyo, Japan, assignor to Tomy Kogyo Company, Incorporated, Japan
Filed Aug. 13, 1982, Ser. No. 407,741
Claims priority, application Japan, Aug. 25, 1981, 56-37330
Term of patent 14 years
U.S. Cl. D21—150

278,734
DUCK-LIKE DOLL
Barbara A. D. Thorndike, Reservoir Rd., Meredith, N.H. 03253
Filed Jun. 14, 1982, Ser. No. 388,099
Term of patent 14 years
U.S. Cl. D21—160

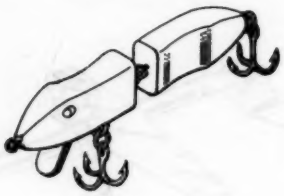
278,735
TOY FIGURE
Jacob Nielsen, Copenhagen, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,757
Term of patent 14 years
U.S. Cl. D21—166

278,736
WHEELED CATERPILLAR TOY
Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed Dec. 27, 1982, Ser. No. 452,889
Term of patent 14 years
U.S. Cl. D21—185



278,737
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979, This application Jun. 29, 1984, Ser. No. 626,646
Term of patent 14 years
U.S. Cl. D21—190

278,738
FISHING LURE
Wilson C. Hargreaves, 120 Pinecliff Lake Dr., West Milford, N.J. 07480
Filed Apr. 7, 1983, Ser. No. 482,859
Term of patent 14 years
U.S. Cl. D22—28

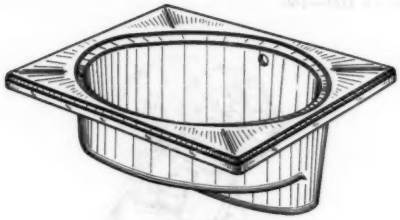


278,739
NON-DRAIN VALVE
Cecil Galloway, Glendora, Calif., assignor to Brownline Pipe, Inc., Laguna Hills, Calif.
Filed Aug. 16, 1982, Ser. No. 408,271
Term of patent 14 years
U.S. Cl. D23—19

278,740
VACUUM BREAKER VALVE
Edwin F. Bolgert, Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Nov. 29, 1982, Ser. No. 444,998
Term of patent 14 years
U.S. Cl. D23—19

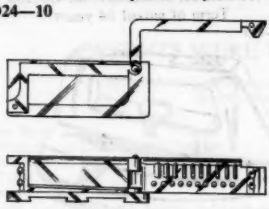
278,741
BATHTUB
Jack N. Kaiser, Rte. 2, Harrodsburg Rd., Danville, Ky. 40422
Filed Mar. 18, 1983, Ser. No. 476,696
Term of patent 14 years
U.S. Cl. D23—55

278,742
BATHTUB
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Aug. 11, 1983, Ser. No. 522,088
Term of patent 14 years
U.S. Cl. D23—55

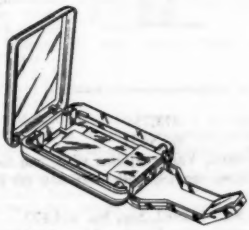


278,743
PARENTERAL INFUSION PUMP
Joseph J. Manno, San Diego, and Stephen H. O'Leary, Encinitas, both of Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Jun. 28, 1982, Ser. No. 392,736
Term of patent 14 years
U.S. Cl. D24—8

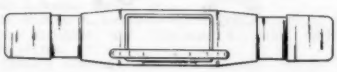
278,744
DENTAL DIE LOCK
Clyde J. Miener, St. Louis, Mo., assignor to Kirkwood Dental Crafts, Inc., St. Louis, Mo.
Filed Sep. 16, 1982, Ser. No. 418,797
Term of patent 14 years
U.S. Cl. D24—10



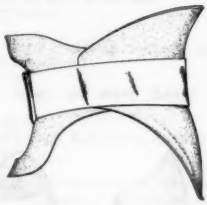
278,745
TOOTH MIRROR
Mitsuo Takahashi, Miyagi, Japan, assignor to Central Koyo Co., Ltd., Miyagi, Japan
Filed Aug. 19, 1982, Ser. No. 409,605
Claims priority, application Japan, Apr. 23, 1981, 56-17110
Term of patent 14 years
U.S. Cl. D24—13



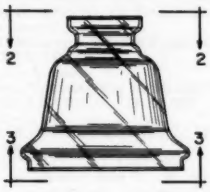
278,746
PULSE TRANSMITTER
Seppo J. Saynajakangas, Kempele, Finland, assignor to Polar Electro Ky, Oulu, Finland
Filed Nov. 26, 1982, Ser. No. 444,533
Claims priority, application Finland, Sep. 10, 1982, 805/82
Term of patent 14 years
U.S. Cl. D24—17



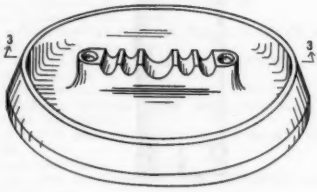
278,747
CERVICAL COLLAR
Clyde E. Peach, Jr, 7045 North 550 East, Brownsburg, Ind. 46112
Filed Sep. 24, 1982, Ser. No. 423,479
Term of patent 14 years
U.S. Cl. D24—64



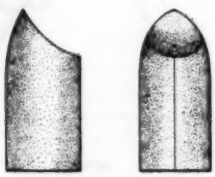
278,748
SHADE OR THE LIKE
Kenneth A. Burket, Horseheads, and Gerhard F. Koenig, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed May 24, 1982, Ser. No. 381,015
Term of patent 14 years
U.S. Cl. D26—132



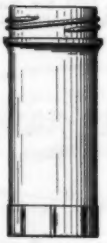
278,749
ASHTRAY
Antal M. Martinovics, 32 Jordan Rd., Chelmsford, Mass. 01863, and Andrew G. Kohalmi, 11 Baron Park La., Apt. 2, Burlington, Mass. 01803
Filed Jun. 7, 1982, Ser. No. 385,897
Term of patent 14 years
U.S. Cl. D27—27



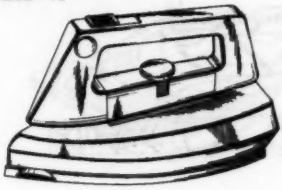
278,750
LIPSTICK
Arthur Pisani, and Robert Pisani, both of Kennelon, N.J., assignors to Cavalla, Inc., Hackensack, N.J.
Filed Sep. 26, 1983, Ser. No. 535,602
Term of patent 14 years
U.S. Cl. D28—4



278,751
DISPENSER TUBE CASING FOR TOILETRY STICK OR THE LIKE
Richard H. Seager, Mystic, Conn., assignor to Calumet Manufacturing Co., East Orange, N.J.
Filed Nov. 9, 1981, Ser. No. 319,808
Term of patent 14 years
U.S. Cl. D28—76

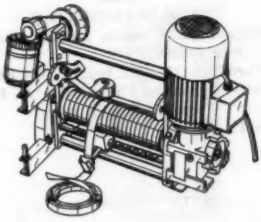


278,752
IRON OR SIMILAR ARTICLE
John C. Shalvoy, Fairfield, Conn., and Gary E. Van Deursen, Upper Saddle River, N.J., assignors to Black & Decker, Inc., Newark, Del.
Filed Jul. 11, 1983, Ser. No. 465,200
Term of patent 14 years
U.S. Cl. D32—70



278,753
MARINE RAILWAY STAND
John H. Honour, VII, 3560 Ivy Pl., Wayzata, Minn. 55391
Filed Sep. 16, 1982, Ser. No. 419,044
Term of patent 14 years
U.S. Cl. D34—31

278,754
WINCH
Bengt-Göran Andersson, Valter Sjölins vä 3, and Gert Liljenborg, Valter Sjölins väg 19, both of S-260 50 Billesholm, Sweden
Filed Sep. 1, 1982, Ser. No. 414,177
Claims priority, application Sweden, Mar. 5, 1982, 82-0520
Term of patent 14 years
U.S. Cl. D34—33



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF MAY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Moelven Brug: *See*—
Falch, Sverre, 4,515,282, Cl. 212-254.000.

Aarflot, Kjell, to Nike, Inc. Sole for cross-country ski shoe. 4,514,916, Cl. 36-117.000.

Abbott Laboratories: *See*—
Manderino, George L.; and Suarez, Adoracion F., 4,515,890, Cl. 435-7.000.
Mendenhall, Douglas W.; and Li, Ping, 4,515,586, Cl. 604-87.000.

Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. Artificial pancreas. 4,515,584, Cl. 604-66.000.

Abe , Ryozo: *See*—
Sigiyama, Hiroyuki; Sakurai, Masaki; Abe , Ryozo; and Yoshihara, Kenji, 4,516,161, Cl. 358-342.000.

Abe, Susumu; Munakata, Akio; and Kitahara, Takeshi, to Fujitsu Limited. Image data conversion method and character code/character pattern conversion apparatus. 4,516,173, Cl. 358-261.000.

Abex Corporation: *See*—
Bownass, Norris; and Clarkson, Donald J., 4,515,184, Cl. 137-625.660.

Abic Ltd.: *See*—
Daniel, Nisim, 4,515,590, Cl. 604-144.000.

Abkowitz, Martin A.: *See*—
Mammino, Joseph; Sypula, Donald S.; Abramsohn, Dennis A.; Abkowitz, Martin A.; and Scharfe, Merlin E., 4,515,882, Cl. 430-58.000.

Abramsohn, Dennis A.: *See*—
Mammino, Joseph; Sypula, Donald S.; Abramsohn, Dennis A.; Abkowitz, Martin A.; and Scharfe, Merlin E., 4,515,882, Cl. 430-58.000.

A'Costa, Anthony. Gun recoil protector. 4,514,862, Cl. 2-268.000.

A'Costa, Anthony. Handgun accuracy control harness. 4,515,301, Cl. 224-204.000.

Acutherm, Ltd.: *See*—
Kline, James R.; and Brand, Peter, 4,515,069, Cl. 98-40.00D.

Adachi, Kiyoshi; Uehara, Masaru; Kitagawa, Hiroshi; Kojima, Hirotaka; and Sato, Masaaki, to Mitsubishi Rayon Company, Limited. Apparatus for continuously packing medical appliances for sterilization. 4,514,965, Cl. 53-553.000.

Adams, Frank H.: *See*—
Danta, William E.; and Adams, Frank H., 4,515,105, Cl. 118-629.000.

Adams, Michael J.: *See*—
Payne, David N.; Sasaki, Issei; and Adams, Michael J., 4,515,475, Cl. 356-73.100.

Adger, Brian M.; and O'Rourke, David J., to Smith Kline & French Laboratories Limited. Synthesis of 2-pyridylalkylamines substituted on the pyridyl ring by bromine. 4,515,952, Cl. 546-329.000.

Adnyana, Dewa N.: *See*—
Rogen, Neil E.; and Adnyana, Dewa N., 4,515,213, Cl. 166-123.000.

Adriaensen, Ludo: *See*—
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,515,905, Cl. 502-309.000.

Advanced Micro Devices, Inc.: *See*—
Frederick, Bruce A., 4,516,225, Cl. 365-203.000.

Advanced Technology Laboratories, Inc.: *See*—
McConaghy, Robert F., 4,515,017, Cl. 73-618.000.

Ag-Chem Equipment Co., Inc.: *See*—
Takata, Harry H., 4,515,311, Cl. 239-172.000.

Agadi, Isaac. Internal combustion engines. 4,515,138, Cl. 123-590.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Mullritter, Ludwig; Schnall, Gunther; and Fruth, Franz, 4,515,356, Cl. 270-53.000.

AGFA-Gevaert N.V.: *See*—
Vackier, Leo N., 4,515,461, Cl. 355-3.0TR.

Agro-Systems, Inc.: *See*—
Anthony, Wilson B., 4,515,816, Cl. 426-69.000.

Air Products and Chemicals, Inc.: *See*—
Greskovich, Eugene J., 4,515,095, Cl. 110-347.000.

Airwick Industries, Inc.: *See*—
Hennart, Claude; and Blanc, Rene , 4,515,768, Cl. 424-40.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Frank, Andrew A.; and Omitsu, Takashi, 4,515,041, Cl. 74-866.000.
Inden, Masahiro; and Kuwana, Kazutaka, 4,515,345, Cl. 251-141.000.

Ajima, Takashi; Ohshima, Jiro; and Koshino, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming deep aluminum doped silicon by implanting Al and Si ions through alumina layer and device formed thereby. 4,515,642, Cl. 148-1.500.

Akashi, Goro: *See*—
Kitamoto, Tatsuji; and Akashi, Goro, 4,515,857, Cl. 428-328.000.

Akerblom, Bengt. Flow-modifying element, especially a rudder. 4,515,101, Cl. 114-162.000.

Akey, Ronald R.: *See*—
Van Gompel, James; and Akey, Ronald R., 4,515,506, Cl. 410-46.000.

Akiba, Shigeyuki: *See*—
Utaka, Katsuyuki; Sakai, Kazuo; and Akiba, Shigeyuki, 4,516,243, Cl. 372-96.000.

Akimoto, Koichi: *See*—
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.000.

Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., to Albright & Wilson Limited. Pourable non-sedimenting aqueous based detergent composition having an organic lamellar structural component. 4,515,704, Cl. 252-135.000.

Aktiebolaget Volvo Penta: *See*—
Ryberg, Bertil; and Mellgren, Kenth, 4,516,000, Cl. 200-44.000.

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Arup, Hans, 4,515,861, Cl. 428-450.000.

Akzona Incorporated: *See*—
Juenger, Rudolf, 4,515,641, Cl. 134-5.000.

Alario, Joseph P.; Brown, Richard F.; and Kosson, Robert L., to United States of America, National Aeronautics and Space Administration. Monogroove heat pipe design: insulated liquid channel with bridging wick. 4,515,207, Cl. 165-1.000.

Alas, Raigo: *See*—
Corvari, John; Ulvr, Joseph; and Alas, Raigo, 4,516,264, Cl. 382-46.000.

Albright, Jay D.: *See*—
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,515,791, Cl. 514-248.000.

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Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., 4,515,704, Cl. 252-135.000.

Alfa Farmaceutici S.p.A.: *See*—
Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, 4,515,809, Cl. 514-533.000.

Alfa-Laval AB: *See*—
Kirschenmann, Bernd R. G., 4,515,823, Cl. 426-491.000.

Alisyncro S.p.A.: *See*—
Bruno, Carlo L., 4,514,963, Cl. 53-493.000.

Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., to American Cyanamid Company. Substituted phenyl-1,2,4-triazolo[2,3-b]pyridazin-3(2H)ones as anti-asthma agents. 4,515,791, Cl. 514-248.000.

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Aron, Mitchell, 4,515,442, Cl. 350-397.000.
Bach, Lloyd G.; and Gaiser, Robert F., 4,514,982, Cl. 60-562.000.
Bose, Debasis; Datta, Amitava; DeChristofaro, Nicholas J.; and Henschel, Claude, 4,515,868, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,869, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,870, Cl. 428-656.000.
Brown, Arthur K.; Fulmer, Keith H.; and Ewald, Jerome T., 4,514,981, Cl. 60-547.100.
Gaiser, Robert F., 4,514,983, Cl. 60-562.000.
Johnson, Duane R., 4,515,258, Cl. 192-91.00A.
Margolin, Mark; Grois, Igor; Herdeg, Peter K.; and Nijman, John P., 4,515,434, Cl. 350-96.210.
Spaargaren, Robert, 4,515,250, Cl. 188-79.5GT.
Vaughn, Edward A., 4,514,880, Cl. 19-0.350.

Allied Flux Reclaiming Ltd.: *See*—
Beck, Alfred; and Van Papeveld, Piet, 4,514,931, Cl. 49-21.000.

Allis-Chalmers Corporation: *See*—
Fisher, Richard K., Jr., 4,515,524, Cl. 415-219.00R.

Alpha-Debon Industries, Inc.: *See*—
Dorsch, Robert; and Matusz, Arnold J., 4,515,073, Cl. 98-115.200.

Alvarado, Alfredo. Surgical glove carton and trash receptacle. 4,515,270, Cl. 206-438.000.

Alvarez, Donald E. Heat recuperator for a strip mill. 4,514,999, Cl. 72-202.000.

ALZA Corporation: *See*—
Urquhart, John; and Theeuwes, Felix, 4,515,585, Cl. 604-85.000.

Amann, Markus: *See*—
Thomann, Roland; and Amann, Markus, 4,515,498, Cl. 404-4.000.

Amano Corporation: *See*—
Iwasawa, Hiroshi; Numata, Masanori; and Mama, Shinichi, 4,516,138, Cl. 346-80.000.

Amano, Yoshifumi, to Sony Corporation. Flat panel display apparatus. 4,516,053, Cl. 313-584.000.

Amemori, Koichi; Kawabe, Toshihiko; and Takahashi, Yosuke, to Yanmar Diesel Engine Co., Ltd. Governor for internal combustion engine. 4,515,120, Cl. 123-368.000.
Amendolia, Pasquale J., to Health Care Concepts, Inc. I.V. flow regulator. 4,515,588, Cl. 604-118.000.
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Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,515,791, Cl. 514-248.000.
Chang, Eugene Y. C., 4,515,933, Cl. 528-57.000.
Chow, San-Laung; and Sims, Bernard, 4,515,810, Cl. 514-530.000.
De Maria, Francesco; and Streetman, William E., 4,515,859, Cl. 428-398.000.
Lang, Stanley A., Jr.; and Murdock, Keith C., 4,515,954, Cl. 548-109.000.
Ling, Chi-Fei, 4,515,855, Cl. 428-290.000.
Schaub, Robert E.; Miner, Thomas G.; and Bernstein, Seymour, 4,515,782, Cl. 514-24.000.
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American Hoechst Corporation: *See*—
Caines, R. Scott, 4,515,863, Cl. 428-480.000.
American Home Products Corporation: *See*—
Demerson, Christopher A.; and Humber, Leslie G., 4,515,961, Cl. 548-432.000.
Santroch, George; and Jirkovsky, Ivo, 4,515,949, Cl. 544-343.000.
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Dyke, Denis G., 4,515,841, Cl. 428-35.000.
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Anderson, Richard N., to Hunter Douglas Inc. Suspension means for suspending venetian blind hanger pivot members. 4,515,201, Cl. 160-174.000.
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Kruger, Hans-Rudolf; Arndt, Friedrich; and Rusch, Reinhard, 4,515,619, Cl. 71-90.000.
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Arrazola, Ignacio M., to McDonnell Douglas Corporation. Transparency for use with a flying spot scanner to generate images. 4,515,450, Cl. 353-5.000.
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Kirby, Edward R., 4,514,901, Cl. 29-822.000.
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Brown, James M.; and Kemper, Kyran B., 4,516,070, Cl. 324-117.00R.
Burrus, Charles A., Jr.; and Stone, Julian, 4,515,612, Cl. 65-3.120.
Ching, Yau-Chau; and Tomcik, James D., 4,516,258, Cl. 381-31.000.
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Farah, Robert L.; and Walters, Stephen M., 4,516,241, Cl. 370-110.100.
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Kinsbron, Eliezer; Lynch, William T.; and Smith, Thomas E., 4,514,893, Cl. 29-571.000.
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Ray, Richard C., 4,516,214, Cl. 364-483.000.
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Gilley, James H., 4,515,484, Cl. 374-137.000.
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Austin, Jon W.; and Vaughn, Cecil C. Peristaltic pumping method and apparatus. 4,515,589, Cl. 604-122.000.

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Peschetz, Johann, 4,515,542, Cl. 425-84.000.

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Narita, Kiichi; Mori, Takasuke; and Ayata, Kenzo, 4,515,203, Cl. 164-468.000.

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Chasar, Dwight W.; and Matheny, Perry D., 4,515,733, Cl. 260-988.000.
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Bach, Lloyd G.; and Gaiser, Robert F., to Allied Corporation. Master cylinder. 4,514,982, Cl. 60-562.000.

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Bachman, Gerald L.; and Vineyard, Billy D., to Monsanto Company. Asymmetric catalysis. 4,515,731, Cl. 260-465.00D.

Bachmann, Heinrich; and Kollmar, Ulrich. Raking apparatus. 4,515,519, Cl. 414-680.000.

Bager, Reinhard. Heavy duty clamping electrical connector. 4,515,426, Cl. 339-42.000.

Baier, Heinz; Kurten, Hans W.; and Waschulewski, Hans-Georg, to Losenhausen Machinenbau AG. Unbalance vibrator. 4,515,027, Cl. 74-87.000.

Bailey, Denis M., to Sterling Drug Inc. Substituted aminobenzoates, their preparation and use. 4,515,980, Cl. 560-45.000.

Baker, Harold L., to Morrison Products, Inc. Center plate-blade interconnection on a centrifugal blower wheel. 4,515,527, Cl. 416-184.000.

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Beimgraben, Herbert W., 4,515,011, Cl. 73-151.000.
Stout, Gregg W., 4,515,217, Cl. 166-297.000.

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Munson, Robert E.; and Haddad, Hussain A., 4,516,097, Cl. 333-261.000.

Ballard, Paul T.; and Little, Gordon R., to Systems Research Laboratories, Inc. Coherent light detecting system including passive averaging network. 4,515,478, Cl. 356-345.000.

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Barclay, Thomas E.; and Zett, John A., to E-Systems, Inc. Variable threshold receiver. 4,516,248, Cl. 375-76.000.

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Baron, Arthur L.; and Krishnan, Sivaram, to Mobay Chemical Corporation. Flame resistant sulfur-bearing copolycarbonate. 4,515,937, Cl. 528-204.000.

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Barr, Colin, to Burroughs Corporation. Electro-optical imaging system. 4,516,032, Cl. 250-578.000.

Barth, Phillip W., to Leland Stanford, Jr. University, The Board of Trustees of the. Semiconductor device having improved lead attachment. 4,516,148, Cl. 357-68.000.

Barton, Felix R. Battery powered fishing reel. 4,515,324, Cl. 242-84.10A.

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Barzynski, Helmut; and Holoch, Klaus, to BASF Aktiengesellschaft. Image-recording materials and image-recording carried out using these to produce an optical mask. 4,515,877, Cl. 430-5.000.

Basevi, Licinio. Instructional chess game. 4,515,371, Cl. 273-260.000.

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Bleckmann, Gerhard; Lynch, John; and Mohr, Heinz, 4,515,375, Cl. 277-1.000.
Gehrung, Manfred; Schoettle, Klaus; Kreissler, Helmut; Rudolf, Peter; Hack, Joachim; and Anslinger, Friedrich, 4,514,937, Cl. 51-281.0SF.
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Lechtken, Peter; Mueller, Gerhard; and Schmieder, Klaus, 4,515,982, Cl. 560-125.000.
Rentzea, Costin; Spiegler, Wolfgang; and Jung, Johann, 4,515,616, Cl. 71-76.000.
Stumpfi, Werner; Bettinger, Gunter; Engel, Friedrich; Fitterer, Horst; Kreimes, Norbert; Pfefferkorn, Dietmar; Schaffer, Norbert; and Schmidts, Kurt, 4,515,331, Cl. 242-199.000.
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Baskett, Theodore N. Self-balanced surface-processing apparatus. 4,514,933, Cl. 51-32.000.

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Baudoux, Richard; and Webb, Anthony J., to T.D. Williamson, Inc. Pressure activated closure lock. 4,515,287, Cl. 220-316.000.

Baumann, William J., to Motorola, Inc. Pulse deinterleaving signal processor and method. 4,516,220, Cl. 364-715.000.

Baxter Travenol Laboratories, Inc.: *See*—
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Bayan, Ghawamedin, to Du Pont de Nemours, E. I., and Company. Polyester hairbrush bristle. 4,515,858, Cl. 428-364.000.

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Holmwood, Graham; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,515,617, Cl. 71-76.000.
Kleiner, Frank; Kubens, Rolf; Reese, Eckart; and Wank, Joachim, 4,515,925, Cl. 525-439.000.
Kuhle, Engelbert; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,515,812, Cl. 514-592.000.
Metzger, Karl G.; Schrock, Wilfried; Habich, Dieter; Naab, Paul; and Zeiler, Hans-Joachim, 4,515,789, Cl. 514-196.000.
Nouvertne, Werner; Serini, Volker; Neuray, Dieter; Binsack, Rudolf; Gehrke, Hans-Georg; Rempel, Dieter; and Krishnai, Sivara, 4,515,918, Cl. 524-504.000.
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Beardmore, David H.; and Needham, Riley B. Method and apparatus for the recovery of hydrocarbons. 4,515,093, Cl. 110-347.000.
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Yang, Shu S.; Beattie, Thomas R.; Durette, Philippe L.; Gallagher, Timothy F.; and Shen, Tsung-Ying, 4,515,722, Cl. 260-403.000.
Beck, Alfred; and Van Papeveld, Piet, to Allied Flux Reclaiming Ltd. Securing device for manhole cover. 4,514,931, Cl. 49-21.000.
Beck, H. Wayne; Lochow, Charles F., Jr.; and Nibert, Charles W., to Ashland Oil, Inc. Passivation of vanadium accumulated on catalytic solid fluidizable particles. 4,515,683, Cl. 208-113.000.
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Beck, Harold K., to Halliburton Company. Low pressure responsive downhole tool with floating shoe retarding means. 4,515,219, Cl. 166-374.000.
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Hettinger, William P., Jr.; and Beck, Hubert W., 4,515,900, Cl. 502-63.000.
Beckett, Joel M., to Marq Packaging Systems, Inc. Programmable case set-up and bottom sealing machine. 4,515,579, Cl. 493-1.000.
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Johnson, Michael D., 4,515,851, Cl. 428-246.000.
Begrich, Rainer, to Ciba Geigy AG. Process for producing 1,8-naphtholactam compounds. 4,515,963, Cl. 548-437.000.
Behr, Raymond D., to Dow Chemical Company, The. Method and apparatus for forming an integral closure for a thermoplastic container. 4,515,647, Cl. 156-91.000.
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Bell, Frank H., to Thiokol Corporation. Inertia type friction initiator for rotating projectiles. 4,515,080, Cl. 102-205.000.
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Benham, Harold H., Jr.; and Wells, Thomas R., 4,515,451, Cl. 353-120.000.
Beltran, Edward R. Accessory kit for flying disc toy. 4,515,570, Cl. 446-47.000.
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Sjogren, C. Norman, 4,514,996, Cl. 70-100.000.
Bemis Company, Inc.: *See*—
Jacobson, Roger K.; and Munson, Ronald W., 4,515,273, Cl. 206-604.000.
Benard, Jacques A. V., to Con Rad Industries, Inc. Apparatus to manufacture heat exchanger finned tube. 4,514,900, Cl. 29-727.000.
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Benditalia S.p.A.: *See*—
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Benham, Harold H., Jr.; and Wells, Thomas R., to Bell & Howell Company. Indexing microfilm. 4,515,451, Cl. 353-120.000.
Benson, Steven R. Double-chambered exhaust manifold. 4,514,986, Cl. 60-605.000.
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Berendt, Hans-Ulrich; and Pacher, Marielise, to Ciba-Geigy Corporation. Process for aftertreating dyed fibrous material made of or containing cellulose. 4,515,596, Cl. 8-107.000.
Beretta, Paolo; and Kitchin, Jonathan P., to Minnesota Mining and Manufacturing Company. Cyanine dyes for sensitizing silver halide emulsions to infrared radiation and photographic elements including them. 4,515,888, Cl. 430-584.000.
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Bergsten, Lars E.: *See*—
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Besic, Frank C., to University Patents, Inc. Food materials for prevention of carious degradation of teeth. 4,515,770, Cl. 424-49.000.
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Hutchison, John B., 4,515,991, Cl. 174-65.0SS.
Bier, Axel, to Audi NSU Auto Union A.G. Circuit for operating a displaceable component in a motor vehicle, in particular a motor vehicle window. 4,516,034, Cl. 307-10.00R.
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Petter, Helmut; Bildstein, Hubert; and Simader, Fritz, 4,516,255, Cl. 378-143.000.
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Duverger, Jean, 4,516,047, Cl. 310-230.000.
Jeffress, Ronald E.; Wanat, David J.; and Krasznai, Charles Z., 4,516,011, Cl. 219-222.000.
Blake, Jon R.; Knutson, Richard K.; and VanHulle, Glenn J., to General Mills, Inc. Preparation of cakes and no-stir dry mix for their preparation. 4,515,824, Cl. 426-554.000.
Blake, Joseph W. Skin staple extractor. 4,515,348, Cl. 254-28.000.
Blake, Walter R., to General Electric Company. Luminaire hinge and latch. 4,516,196, Cl. 362-311.000.
Blanc, Rene : *See*—
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Blaschek, Otto, to Arnold & Richter Cine Technik GmbH. & Co. Betriebs KG. Motion picture camera having an interchangeable lens. 4,515,469, Cl. 355-35.000.
Blatt, Georg; van den Boom, Johannes; Kuipers, Geert; and Hollerweger, Heinz, to Audi NSU Auto Union A.G. Noise reduction lining. 4,515,239, Cl. 181-290.000.
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Nolting, Peter; and Bleger, Claude, 4,516,106, Cl. 338-28.000.
Block, Dale A., to Kohler Co. Handle assembly. 4,515,037, Cl. 74-553.000.
Blumer, David J., to Occidental Research Corporation. Process for extracting tungsten or molybdenum from solution. 4,515,756, Cl. 423-54.000.
Bly, Vincent T., to United States of America, Army. Passive optical system for background suppression in starring imagers. 4,515,443, Cl. 350-396.000.
Bobjer, Olle; Dahlin, Torsten; and Grieves, John. Ventilation method and apparatus. 4,515,070, Cl. 98-42.070.
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., to International Flavors & Fragrances Inc. Process for preparing a methoxybenzaldehyde from the corresponding phenolic benzaldehyde. 4,515,987, Cl. 568-433.000.
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Husslein, Gerd; Hamprecht, Gerhard; Koenig, Karl-Heinz; Boehm, Walter; and Gaeng, Manfred, 4,515,985, Cl. 562-472.000.

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Klose, Sigmar; Stahler, Fritz; Lange, Hans; and Kleemann, Wolfgang, 4,515,889, Cl. 435-4.000.
Boeing Company, The: *See*—
McDermott, Arthur W., 4,516,104, Cl. 336-206.000.
Phillips, Michael J., 4,515,051, Cl. 83-146.000.
Wagner, David L., 4,515,260, Cl. 193-44.000.
Boese, Harold L., to HKC, Inc. Occupant propelled wheeled device. 4,515,382, Cl. 280-221.000.
Bogardus, Rodger E.; Packer, Jon D.; and SaNogueira, Peter, to Richardson-Vicks Inc. Reducing sebum spreading. 4,515,784, Cl. 514-63.000.
Boger, Manfred; and Drabek, Jozef, to Ciba Geigy Corporation. Benzoylparabanic acids. 4,515,798, Cl. 514-341.000.
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Bohner, Beat, to Ciba Geigy Corporation. Triaza compounds. 4,515,620, Cl. 71-91.000.
Boigegrain, Robert; Maffrand, Jean-Pierre; Suzuki, Norio; Matsubayachi, Kynichi; and Ashida, Shinichiro, to Sanofi. Preparation of 5,6,7,7a-tetrahydro-4H-thieno[3,2-c]pyridin-2-one compounds. 4,515,951, Cl. 546-114.000.
Boiston, David A.: *See*—
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Bolick, Fred C., Jr.; and Plunkett, Luther C., Jr., to Lanier Business Products, Inc. Telephone answering machine with apparatus for selecting particular outgoing message in response to incoming call on a particular line. 4,515,995, Cl. 179-6.130.
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Lindquist, Bjorn K. V.; and Petersson, Stig A., 4,515,631, Cl. 75-73.000.
Bolle, Gunter; Bragas, Peter; and Eschke, Bernd, to Robert Bosch GmbH. Combination electronic road guidance and communication system for vehicles. 4,515,994, Cl. 179-2.00R.
Bolwig, Rolf W., to Rotabo Industries Inc. Lamp carriage arm for safety hats. 4,516,192, Cl. 362-107.000.
Bond, Kevin; and Watson, Brian W., to Cossar Electronics Limited. Antenna with a reflector of open construction. 4,516,132, Cl. 343-815.000.
Bond, Michael J., to Gillette Company, The. Razor handle. 4,514,904, Cl. 30-87.000.
Bone, Kendall F., to Cincinnati Milacron Inc. Heat exchange apparatus for electric motor and electric motor equipped therewith. 4,516,044, Cl. 310-64.000.
Bonetti, William F.: *See*—
Deckert, Cheryl A.; Couble, Edward C.; and Bonetti, William F., 4,515,829, Cl. 427-97.000.
Borchard, Heinz; Knothe, Herbert; and Rybka, Bruno, to Teldec Telefunken-Decca Schallplatten GmbH. Disc-shaped information carrier having a high storage density. 4,515,843, Cl. 428-64.000.
Borden, Inc.: *See*—
Merritt, Carleton G.; Wingerd, Winston H.; and Keller, David J., 4,515,769, Cl. 424-49.000.
Borel, Georg, to Hermann Wangner GmbH & Co. KG. Composite fabric for use as clothing for the sheet forming section of a papermaking machine. 4,515,853, Cl. 428-257.000.
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Haley, William J.; and Neumann, Guenter J., 4,515,255, Cl. 192-3.570.
Jenkins, Patrick A.; and Ferguson, Donald A., 4,515,012, Cl. 73-168.000.
Borgschulte, Fritz: *See*—
Trumper, Thomas; Schoop, Gunther-Dietmar; Borgschulte, Fritz; and Krummnack, Friedrich, 4,515,410, Cl. 299-43.000.
Borner, Roland; and Holstein, Herbert. Scanning device for a machine for the automatic sharpening of broaching or reaming tools. 4,514,935, Cl. 51-165.00R.
Borowick, John: *See*—
Bayha, William T.; Borowick, John; Stern, Richard A.; and Babbitt, Richard W., 4,516,131, Cl. 343-785.000.
Borroughs Tool & Equipment Corporation: *See*—
Okamuro, James A., 4,515,376, Cl. 277-9.500.
Borst, Erich; Schadlich, Fritz; and Stabler, Manfred, to Robert Bosch GmbH. Electric power machine with protection against overspeed. 4,516,045, Cl. 310-68.00E.
Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, to Alfa Farmaceutici S.p.A. Derivatives of benzoylphenoxyalkanoic acids having normolipemizing activity. 4,515,809, Cl. 514-533.000.
Bose, Debasis; Datta, Amitava; DeChristofaro, Nicholas J.; and Henschel, Claude, to Allied Corporation. Homogeneous, ductile cobalt based hardfacing foils. 4,515,868, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, to Allied Corporation. Homogeneous, ductile nickel based hardfacing foils. 4,515,869, Cl. 428-656.000.
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Boskovic, Borislav. Slide retainer. 4,515,342, Cl. 249-122.000.
Botzman, Thomas J.: *See*—
Kaniecki, Michael; Landers, Samuel P.; and Botzman, Thomas J., 4,515,199, Cl. 152-353.00R.
Bouchard, Andre C.: *See*—
Hall, Harold H., Jr.; and Bouchard, Andre C., 4,515,558, Cl. 431-359.000.
Boudart, Michel; Oyama, Shigeo T.; and Volpe, Leo, to Leland Stanford Jr. Univeristy, Board of Trustees of. High specific surface area carbides and nitrides. 4,515,763, Cl. 423-409.000.
Boudault, Robert, to 501 Telecommunications Radioelectriques et Telephoniques. Frequency modulator for the transmission of analog data. 4,516,086, Cl. 332-16.00R.
Bourgo, Edward A.: *See*—
Curtis, James J.; and Bourgo, Edward A., 4,514,995, Cl. 66-170.000.
Boute, Willem: *See*—
Wittkampf, Frederik H. M.; and Boute, Willem, 4,515,161, Cl. 128-419.0PG.
Bowden, William L.; and Dey, Arabinda N., to Duracell Inc. Inorganic rechargeable non-aqueous cell. 4,515,875, Cl. 429-196.000.
Bowen, Collin W. Water lift system. 4,514,977, Cl. 60-398.000.
Bowen, David R.: *See*—
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Bownass, Norris; and Clarkson, Donald J., to Abex Corporation. Modular directional valve. 4,515,184, Cl. 137-625.660.
Boy-Marcotte, Jean L. M. R.; Chastang, Georges J.; Salvaire, Laurent O.; and Burnouf, Christian D., to Rossignol S.A.; and Bertin et Cie. Cylindro-parabolical solar energy collector. 4,515,148, Cl. 126-438.000.
Boyer, Nicodemus E., to PPG Industries, Inc. Polyhalophthalimidoalkyl-functional carbonates. 4,515,964, Cl. 548-463.000.
Bozung, Richard E. Musical instrument having a rigid base with circle of tone bars and pattern guides. 4,515,062, Cl. 84-403.000.
Bradley, Robert E.; and Keithler, William R., to Lockheed Corporation. Protective coating composition and process for aluminum and aluminum alloys. 4,515,919, Cl. 524-591.000.
Bragas, Peter: *See*—
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Brand, Glen. Flow monitoring method and device. 4,515,022, Cl. 73-861.790.
Brand, Peter: *See*—
Kline, James R.; and Brand, Peter, 4,515,069, Cl. 98-40.00D.
Brandes, Wilhelm: *See*—
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Stegelmeier, Hartmut; and Brandes, Wilhelm, 4,515,801, Cl. 514-403.000.
Brashears, David F.; and Mollick, Joseph T., to Mechtron International Corp. Solid fuel burner. 4,515,090, Cl. 110-264.000.
Braslaw, Jacob: *See*—
Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., 4,515,659, Cl. 201-2.500.
Brazdil, James F., Jr.; Marritt, William A.; and Ward, Michael D., to Standard Oil Company, The. Conversion of acetonitrile to glycolonitrile and/or glycolamide. 4,515,732, Cl. 260-465.600.
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Breher, Rudolf, 4,515,743, Cl. 264-135.000.
Breedlove, Paul S.; and Moore, James H., to Texas Instruments Incorporated. Electronic learning aid or game having synthesized speech. 4,516,260, Cl. 381-51.000.
Breher, Rudolf, to BRECO Kunststoffverarbeitungs- GmbH & Co. KG. Method of producing a reinforced toothed belt having a fabric cover. 4,515,743, Cl. 264-135.000.
Brendley, William H., Jr.: *See*—
Kuhn, Robert R.; Whiteman, John D.; and Brendley, William H., Jr., 4,515,835, Cl. 427-388.300.
Bresson, Clarence R.; and Louthan, Rector P. Ore flotation and flotation agents for use therein. 4,515,687, Cl. 209-167.000.
Brich, Zdenek; and Muhle, Herbert, to Sandoz Ltd. Process for the isomerization of ergovine derivatives. 4,515,950, Cl. 546-67.000.
Bridges, Ernest: *See*—
Ittipiboon, Apisak; Shafai, Lotfollah; and Bridges, Ernest, 4,516,129, Cl. 343-772.000.
Bridgestone Tire Company Limited: *See*—
Kajigaya, Shinichi; and Nakaya, Mitsuo, 4,515,502, Cl. 405-215.000.
Motomura, Kenichi; Ogawa, Hiroshi; Yamamoto, Akira; and Hagita, Noriyuki, 4,515,197, Cl. 152-209.00R.
Sakakibara, Mitsuhiko; Yoshizawa, Masao; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,515,922, Cl. 525-99.000.
Brigham, Robert N., to Superior Electric Company, The. Stator with nonuniformly spaced teeth for rotating electromagnetic device. 4,516,048, Cl. 310-254.000.
Bristol Fiberlite Industries: *See*—
Doell, Aubrey C., 4,514,944, Cl. 52-200.000.
British Aerospace Public Limited Company: *See*—
Grainge, Richard W.; and Humphries, Rowland F., 4,516,158, Cl. 358-109.000.
Kaye, Arthur; Carr, Brian; and Latham, Philip A., 4,516,063, Cl. 318-685.000.
British Gas Corporation: *See*—
Williams, John P., 4,515,562, Cl. 432-225.000.
Broaddus, Wayne R.; Jaber, Khalil N.; and Orofino, Thomas A., to Monsanto Company. Permeable asphaltic concrete base for artificial turf. 4,515,839, Cl. 428-17.000.
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., to Hoffmann-La Roche Inc. Cyclic compounds. 4,515,969, Cl. 549-39.000.
Brooks, Burton, to Chemithon Corporation, The. Intermediate product for use in producing a detergent bar and method for producing same. 4,515,707, Cl. 252-368.000.

Brooks, Gary T.; and Cole, Bill W., to Standard Oil Company (Indiana). Injection moldable amide-imide polymers and copolymers containing semi-crystalline and amorphous polyamides. 4,515,924, Cl. 525-432.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Yasui, Tsuneo, 4,516,137, Cl. 346-76.0PH.

Brown, Arthur K.; Fulmer, Keith H.; and Ewald, Jerome T., to Allied Corporation. Brake booster. 4,514,981, Cl. 60-547.100.

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Steinleitner, Gunther, 4,515,874, Cl. 429-104.000.

Brown, Edward G., to CBM-Oil Reclamation Systems, Inc. Oil reclamation process and apparatus therefor. 4,515,684, Cl. 208-180.000.

Brown, James M.; and Kemper, Kyran B., to AT&T Bell Laboratories. Magnetic current sensor with offset and load correction. 4,516,070, Cl. 324-117.00R.

Brown, Richard F.: *See*—
Alario, Joseph P.; Brown, Richard F.; and Kosson, Robert L., 4,515,207, Cl. 165-1.000.

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Parquet, Donald J.; Brown, Thomas R.; and Edwards, Eldon R., 4,515,520, Cl. 414-718.000.

Brown & Williamson Tobacco Corporation: *See*—
Cantrell, Daniel V.; and Sanford, Robert A., 4,515,170, Cl. 131-336.000.
Gilbert, Jerry R.; Millikan, Robert C.; Wysowski, Charles H.; and Pyburn, John R., Jr., 4,515,518, Cl. 414-459.000.

Brownell, David J.; and Roberts, Jon A., to Honeywell Inc. Method of forming a dielectric layer comprising a gettering material. 4,515,668, Cl. 204-192.00D.

Brubaker, Robert C.: *See*—
Pardini, John A.; Brubaker, Robert C.; and Rusnak, John J., 4,515,750, Cl. 376-446.000.

Bruene, Warren B., to Rockwell International Corporation. Method for reducing side-lobe energy in an MSK detectable signal. 4,516,087, Cl. 332-17.000.

Brumfield, Donald E.: *See*—
Meigs, William; Guffey, David M.; and Brumfield, Donald E., 4,514,948, Cl. 52-397.000.

Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., to General Electric Company. Microcomposite of metal carbide and ceramic particles. 4,515,746, Cl. 264-332.000.

Bruni, Ludovico, to Associated Engineering Italy S.p.A. Piston shaping. 4,515,003, Cl. 72-370.000.

Bruno, Carlo L., to Alisyncro S.p.A. System for regulating the feed of articles to a wrapping machine. 4,514,963, Cl. 53-493.000.

Brunswick Corporation: *See*—
de Winter, Dirk M., 4,515,606, Cl. 55-159.000.

Bruske, Heinz-Dieter: *See*—
Kwasnik, Hans-Jurgen; Piduch, Hans-Gunter; and Bruske, Heinz-Dieter, 4,515,660, Cl. 202-241.000.

Brutsman, James W. Drain apparatus. 4,515,188, Cl. 141-1.000.

BTR South Africa Limited: *See*—
Gehrke, Erich F., 4,515,309, Cl. 238-349.000.

Bucher, Robert R.: *See*—
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Buck, Rainer; Kull, Hermann; Piwonka, Fridolin; Sieber, Albrecht; Stumpp, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Safety arrangement for an internal combustion engine. 4,515,125, Cl. 123-359.000.

Bucking, Hans-Walter: *See*—
Billenstein, Siegfried; Hartung, Herbert; May, Adolf; and Bucking, Hans-Walter, 4,515,723, Cl. 260-404.500.

Budapesti Muszaki Egyetem: *See*—
Varga, Laszlo; Krekacs, Sandor; Latorcai, Janos; Palfi, Zoltan; and Fledrich, Istvan, 4,514,911, Cl. 34-22.000.

Budd Co., The: *See*—
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Budinger, A. Bowman: *See*—
Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,516,057, Cl. 315-260.000.

Buehler, Martin G., to United States of America, National Aeronautics and Space Administration. Split-cross-bridge resistor for testing for proper fabrication of integrated circuits. 4,516,071, Cl. 324-158.00R.

Buguet, M. Maurice; and Deruelle, M. Patrick, to Le Metal Deploye. Electrical resistor of stretched sheet metal. 4,516,108, Cl. 338-319.000.

Burger, Raymond. Apparatus with optical projector for assembling a wooden structure. 4,514,899, Cl. 29-721.000.

Burger, Raymond. Roller chain and its use for the movement of one surface in bearing relation with another. 4,515,578, Cl. 474-231.000.

Burgin, Kenneth N., to U.S. Philips Corporation. Telephone circuit. 4,515,996, Cl. 179-81.00B.

Burkhalter, John F.: *See*—
Rao, S. Prabhakara; and Burkhalter, John F., 4,515,635, Cl. 106-90.000.

Burkleca, Frank M. Firearm recoil buffer. 4,514,921, Cl. 42-1.00V.

Burlington Industries, Inc.: *See*—
Payne, William M., Jr., 4,515,328, Cl. 242-131.000.

Burnes, Edward E.; and Bhatia, Kishan, to NL Industries, Inc. Process of removing hydrogen sulfide from gas mixtures. 4,515,759, Cl. 423-220.000.

Burnouf, Christian D.: *See*—
Boy-Marcotte, Jean L. M. R.; Chastang, Georges J.; Salvaire, Laurent O.; and Burnouf, Christian D., 4,515,148, Cl. 126-438.000.

Burow, Kenneth W., Jr., to Eli Lilly and Company. Benzamides, compositions and agricultural method. 4,515,625, Cl. 71-92.000.

Burroughs Corporation: *See*—
Barr, Colin, 4,516,032, Cl. 250-578.000.
Koos, William M., Jr., 4,515,292, Cl. 222-52.000.
Warren, Robert G.; and Robertson, Michael A., 4,516,201, Cl. 364-200.000.

Burrus, Charles A., Jr.; and Stone, Julian, to AT&T Bell Laboratories. Method for optical fiber fabrication including deuterium/hydrogen exchange. 4,515,612, Cl. 65-3.120.

Buschbom, Floyd E.; and Hansen, Glen D., to Veda, Inc. Fluid pressure power transmission. 4,514,978, Cl. 60-426.000.

Bush Boake Allen Limited: *See*—
Ferber, John G.; Goddard, Peter J.; and Holden, Robert S., 4,515,990, Cl. 568-808.000.

Bushman, James B.: *See*—
Dimond, James R.; and Bushman, James B., 4,515,669, Cl. 204-196.000.

Butler, John C.: *See*—
Kuehnle, Manfred R.; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,515,879, Cl. 430-31.000.

Byler, Richard E.: *See*—
McCarthy, James P.; and Byler, Richard E., 4,515,176, Cl. 137-115.000.

Byszewski, Wojciech W.: *See*—
Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,516,057, Cl. 315-260.000.

C. Otto & Comp. G.m.b.H.: *See*—
Kwasnik, Hans-Jurgen; Piduch, Hans-Gunter; and Bruske, Heinz-Dieter, 4,515,660, Cl. 202-241.000.

C. R. Bard, Inc.: *See*—
Norton, William J., 4,515,593, Cl. 604-265.000.

Cadeddu, Leonardo, to Benditalia S.p.A. Master cylinder. 4,514,985, Cl. 60-589.000.

Cahill, Lysle D.: *See*—
Kuehnle, Manfred R.; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,515,879, Cl. 430-31.000.

Caines, R. Scott, to American Hoechst Corporation. Polyester film primed with phosphorus-containing polyester. 4,515,863, Cl. 428-480.000.

Calabrese, Anthony, to Charles Greiner & Company, Inc. Stabilizer for cervical collar. 4,515,153, Cl. 128-75.000.

Caldero Ges, Jose M.; and Faba, Eusebio M., to Inke, S.A. Furan derivatives and addition salts thereof pharmaceutical compositions and the therapeutical applications thereof. 4,515,806, Cl. 514-471.000.

Calvert, Colin: *See*—
Cox-Smith, Peter; Calvert, Colin; and Wesley, John, 4,515,582, Cl. 494-7.000.

Cameron Iron Works, Inc.: *See*—
Smith, Jerry D.; and Szymczak, Edward J., 4,515,400, Cl. 285-141.000.

Campau, Daniel N. Liquid level control device. 4,515,178, Cl. 137-393.000.

Campbell, Malcolm G. Portable electronic camera. 4,516,157, Cl. 358-108.000.

Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., to Pfizer Inc. Dihydropyridine anti-ischaemic and antihypertensive agents. 4,515,799, Cl. 514-341.000.

Canadian Patents & Dev. Ltd.: *See*—
Ittipiboon, Apisak; Shafai, Lotfollah; and Bridges, Ernest, 4,516,129, Cl. 343-772.000.

Cannon, Warren R.: *See*—
Wu, Jenn-Ming; Cannon, Warren R.; and Panzera, Carlino, 4,515,634, Cl. 106-35.000.

Canon Kabushiki Kaisha: *See*—
Knechtel, Wilhelm, 4,515,460, Cl. 355-3.0TR.
Masuda, Shunichi; Yagasaki, Toshiaki; and Kasuya, Yukio, 4,515,458, Cl. 355-3.0SH.
Takahashi, Sadatoshi; Tsuji, Sadahiko; Tajima, Akira; Asano, Toshiaki; and Minami, Setsuo, 4,515,446, Cl. 350-427.000.
Yamada, Yasuyoshi; and Hiraga, Ryozo, 4,515,481, Cl. 356-409.000.

Canon Kabushuki Kaisha: *See*—
Tsuzuki, Hiroyoshi, 4,515,452, Cl. 354-106.000.

Cantagrel, Michel: *See*—
Hardy, Patrick; Cantagrel, Michel; and Guichard, Serge, 4,516,186, Cl. 361-306.000.

Cantella, Michael J.: *See*—
Dion, Donald F.; and Cantella, Michael J., 4,516,167, Cl. 358-160.000.

Cantrell, Daniel V.; and Sanford, Robert A., to Brown & Williamson Tobacco Corporation. Ventilated mouthpiece for a smoking article. 4,515,170, Cl. 131-336.000.

Caputo, William R., to Westinghouse Electric Corp. Elevator system. 4,515,247, Cl. 187-29.00R.

Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Eichinger, Johann, 4,515,573, Cl. 464-69.000.

Carl, William P.: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,515,989, Cl. 568-674.000.

Carl-Zeiss-Stiftung: *See*—
Weimer, Eugen; and Muller, Gerhard, 4,515,447, Cl. 350-527.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Esswein, Karlheinz, 4,515,439, Cl. 350-257.000.
Muller, Gerhard; and Schwarz, Jurgen, 4,515,445, Cl. 350-524.000.

Carl-Zeiss-Stuftung, Heidenheim/Brenz: *See*—
Szenger, Franz, 4,515,415, Cl. 308-6.00R.

Carlo, Louis D., to Mr. Gasket Company. Dual mode shifter for automatic transmissions. 4,515,033, Cl. 74-476.000.

Carney, Thomas E.; Champion, Allan R.; and Logullo, Francis M., Sr., to Du Pont de Nemours, E. I., and Company. Reinforced cement. 4,515,636, Cl. 106-90.000.

Carr, Brian: *See*—
Kaye, Arthur; Carr, Brian; and Latham, Philip A., 4,516,063, Cl. 318-685.000.

Carr, Edward F., to University of Maine, Board of Trustees of the. Active regulation of heat transfer. 4,515,206, Cl. 165-1.000.

Carrier Corporation: *See*—
Mount, Gordon L., 4,514,989, Cl. 62-201.000.
Zinsmeyer, Thomas M., 4,514,991, Cl. 62-209.000.

Carroll, Robert, to Energy Conversion Devices, Inc. Apparatus and method for detecting tumors. 4,515,165, Cl. 128-664.000.

Cars & Concepts, Inc.: *See*—
Draper, David L., 4,514,891, Cl. 29-401.100.

Carsalade, Henri; Delaporte, Francois-Xavier; and Pantani, Jean-Pierre, to International Business Machines Corporation. Signal receiver which indicates the status of the device connected thereto. 4,516,247, Cl. 375-56.000.

Carsonite International Corporation: *See*—
Schmanski, Donald W., 4,516,069, Cl. 324-71.100.

Caruso, Anthony M. Anti-personnel fragmentation liner. 4,515,083, Cl. 102-493.000.

Casey, Morton P., Jr.: *See*—
Komanduri, Ranga; Ettinger, Robert H.; Casey, Morton P., Jr.; and Reed, William R., Jr., 4,515,047, Cl. 82-1.00C.

Casio Computer Co. Ltd.: *See*—
Kashio, Toshio, 4,515,056, Cl. 84-1.010.

Cassidy, John E.; and Jones, L. Raymond, Jr., to Electro-Nite Co. Molten metal sample cup. 4,515,485, Cl. 374-157.000.

Castronovo, Frank P.; Strauss, Harry W.; and Potsaid, Majic S., to Massachusetts General Hospital, The. Labeled phosphonic acid compositions for investigations of in vivo deposits of calcium. 4,515,766, Cl. 424-1.100.

Caterpillar Tractor Co.: *See*—
Dezelan, Joseph E., 4,515,181, Cl. 137-596.000.
Ray, Robert W.; and Pierce, Rex G., 4,514,934, Cl. 51-165.00R.

Cathey, Thaddeus F.; Gaynor, John C.; and Nelson, Rodney J., to Uniroyal, Inc. Low backlash-high-torque power transmission system and toothed belt used therein. 4,515,577, Cl. 474-204.000.

Cavanagh, Kenneth M., to Marshall and Williams Company. Air knife apparatus. 4,515,313, Cl. 239-455.000.

Cavero, Icilio; Langer, Salomon Z.; and York, Billie M., Jr. Method of lowering intraocular pressure using phenylimino-imidazoles. 4,515,800, Cl. 514-392.000.

CBM-Oil Reclamation Systems, Inc.: *See*—
Brown, Edward G., 4,515,684, Cl. 208-180.000.

CBS Inc.: *See*—
Torick, Emil L., 4,516,257, Cl. 381-4.000.

Celanese Corporation: *See*—
McLaughlin, William D., Jr., 4,515,054, Cl. 83-663.000.

CEM Compagnie Electro-Mecanique: *See*—
Mercier, Rene, 4,516,046, Cl. 310-154.000.

Central Glass Co., Ltd.: *See*—
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,515,709, Cl. 252-509.000.

Centre National de la Recherche Scientifique CNRS: *See*—
Jouffrey, Bernard; Trinquier, Jacques; and Franceschi, Jean-Luc, 4,516,026, Cl. 250-310.000.

Cerberus AG: *See*—
Frigon, Raymond A.; and Kahl, William G., Jr., 4,516,115, Cl. 340-556.000.

Cerkovnik, Jerry, to Christensen, Inc. Nozzle placement in a diamond rotating bit including a pilot bit. 4,515,227, Cl. 175-65.000.

Chalk, Alan J.; and Purzycki, Kenneth L., to Givaudan Corporation. Alkenoxy octadienes as odorants. 4,515,711, Cl. 252-522.00R.

Champion, Allan R.: *See*—
Carney, Thomas E.; Champion, Allan R.; and Logullo, Francis M., Sr., 4,515,636, Cl. 106-90.000.

Champion, Perrine & Associates: *See*—
Perrine, Paul M.; and Perrine, Carol-Anne, 4,515,516, Cl. 417-38.000.

Chan, Raymond Y.: *See*—
Emery, Jared M.; and Chan, Raymond Y., 4,515,794, Cl. 514-249.000.

Chandler, Donald E.; Chisholm, William M.; and Lechner, Ralph T., to AT&T Technologies, Inc. Fixture for assembling pins into a shuttle. 4,515,354, Cl. 269-15.000.

Chandler, James W.; and Chandler, William D., to Water Soft, Inc. Water filter. 4,515,692, Cl. 210-278.000.

Chandler, William D.: *See*—
Chandler, James W.; and Chandler, William D., 4,515,692, Cl. 210-278.000.

Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Catalysis over activated high silica zeolites. 4,515,682, Cl. 208-111.000.

Chang, Eugene Y. C., to American Cyanamid Company. One-component polyurethane adhesive compositions. 4,515,933, Cl. 528-57.000.

Chang, Jenq S.; and Chang, Tung S., to Storage Technology Partners. Reduction of contact resistance in CMOS integrated circuit chips and the product thereof. 4,516,145, Cl. 357-42.000.

Chang, Tung S.: *See*—
Chang, Jenq S.; and Chang, Tung S., 4,516,145, Cl. 357-42.000.

Chao, Chung-Yao: *See*—
Polan, Ned W.; and Chao, Chung-Yao, 4,515,671, Cl. 204-228.000.

Charles Greiner & Company, Inc.: *See*—
Calabrese, Anthony, 4,515,153, Cl. 128-75.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Dew, Brock S.; and Greiff, Paul, 4,516,263, Cl. 382-41.000.

Charters, John E. Carbonaceous briquette. 4,515,601, Cl. 44-19.000.

Chasar, Dwight W.; and Matheny, Perry D., to B. F. Goodrich Co., The. Method for making 1,3,5,2,4,6-trioxatriphosphorinanes. 4,515,733, Cl. 260-988.000.

Chastang, Georges J.: *See*—
Boy-Marcotte, Jean L. M. R.; Chastang, Georges J.; Salvaire, Laurent O.; and Burnouf, Christian D., 4,515,148, Cl. 126-438.000.

Chaudhari, Praveen; and Muller, Rene , to International Business Machines Corporation. Method for producing large grained semiconductor ribbons. 4,515,650, Cl. 156-622.000.

Cheek, Alton E. Overshot. 4,515,403, Cl. 294-86.310.

Cheffer, Harold H.: *See*—
Rhoads, Paul M.; and Cheffer, Harold H., 4,516,035, Cl. 307-66.000.

Chemithon Corporation, The: *See*—
Brooks, Burton, 4,515,707, Cl. 252-368.000.

Chen, Chee G., to Eaton Corporation. Transparent touch switching system. 4,516,112, Cl. 340-365.00R.

Chen, Henry C. J.: *See*—
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,514,954, Cl. 53-53.000.

Chen, Nai Y.; and Miale, Joseph N., to Mobil Oil Corporation. Fermentation process. 4,515,892, Cl. 435-161.000.

Cheng, Peter S. C. Ribbon for forming a decorative bow. 4,515,837, Cl. 428-4.000.

Chester, Martin H.; and Norman, Cary A. Clamp-on nerve stimulator and locator. 4,515,168, Cl. 128-741.000.

Chevrel, Roger; Attard, Michel; and Leviandier, Michel, to Compagnie d'Informatique Militaire Spatiale & Aeronautique-CIMSA-25. Device for opening and closing an exit slit for a data carrier and a printer utilizing such device. 4,515,491, Cl. 400-693.000.

Chevron Research Company: *See*—
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,515,757, Cl. 423-54.000.
Loh, William, 4,515,618, Cl. 71-88.000.

Childs, Jerry; Sabins, Fred; and Taylor, Mary J., to Halliburton Company. Method of using thixotropic cements for combating lost circulation problems. 4,515,216, Cl. 166-293.000.

Ching, Yau-Chau; and Tomcik, James D., to AT&T Bell Laboratories. Bit allocation generator for adaptive transform coder. 4,516,258, Cl. 381-31.000.

Chisholm, William M.: *See*—
Chandler, Donald E.; Chisholm, William M.; and Lechner, Ralph T., 4,515,354, Cl. 269-15.000.

Chiu, Te-Long; and Lien, Jih-Chang, to Texas Instruments Incorporated. Electrically programmable floating gate semiconductor memory device. 4,514,897, Cl. 29-578.000.

Chodorow, Marvin: *See*—
Shaw, Herbert J.; Chodorow, Marvin; and Digonnet, Michel J. F., 4,515,431, Cl. 350-96.150.

Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., to Garrett Corporation, The. Supercharged diesel engine air inflow control system. 4,515,136, Cl. 123-564.000.

Chonan, Kenichi: *See*—
Ito, Tosikazu; Komathuzaki, Kiyomi; Chonan, Kenichi; and Horibe, Kiyoshi, 4,515,066, Cl. 91-454.000.

Chow, San-Laung; and Sims, Bernard, to American Cyanamid Company. Composition of matter. 4,515,810, Cl. 514-530.000.

Christensen, Inc.: *See*—
Cerkovnik, Jerry, 4,515,227, Cl. 175-65.000.

Christian, Dixon W. Wheelchair and attachment therefor. 4,515,385, Cl. 280-289.0WC.

Christiano, Vito F.: *See*—
Smith, John L.; and Christiano, Vito F., 4,515,753, Cl. 422-102.000.

Christidis, Yani; and Vallejos, Jean-Claude, to Societe Francaise Hoechst. Process for preparation of alkanoic acids. 4,515,970, Cl. 549-79.000.

Christoff, William J., to Rockwell International Corporation. Integrated auxiliary power and environmental control unit. 4,514,976, Cl. 60-39.070.

Christoleit, Arno, to WABCO Westinghouse Fahrzeugbremsen GmbH. Disabling arrangement for a reciprocating piston compressor. 4,515,530, Cl. 417-214.000.

Christopher, Robert J.; and Walker, Robert F., to International Business Machines Corporation. Entity control for raster displays. 4,516,266, Cl. 382-48.000.

Chung, Rack H., to General Electric Company. End-capping catalysts for forming alkoxy-functional one component RTV compositions. 4,515,932, Cl. 528-16.000.

Churma, Theodore; Latimer, Elwood D., Jr.; and Vicik, Stephen J., to Union Carbide Corporation. Modification of ethylene vinyl acetate copolymer. 4,515,745, Cl. 264-211.000.

Ciba Geigy AG: *See*—
Begrich, Rainer, 4,515,963, Cl. 548-437.000.

Ciba-Geigy Corporation: *See*—
Berendt, Hans-Ulrich; and Pacher, Marielise, 4,515,596, Cl. 8-107.000.
Boger, Manfred; and Drabek, Jozef, 4,515,798, Cl. 514-341.000.
Bohner, Beat, 4,515,620, Cl. 71-91.000.

Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,515,717, Cl. 260-239.00A.
Guth, Christian; and Schafer, Paul, 4,515,597, Cl. 8-107.000.
Kaschig, Jurgen; Kleiner, Eduard K.; Nueller, Karl F.; and Cooke, Thomas W., 4,515,640, Cl. 106-287.250.
Kaser, Adolf, 4,515,599, Cl. 8-685.000.
Renner, Alfred, 4,515,962, Cl. 548-435.000.
Szczepanski, Henry, 4,515,626, Cl. 71-93.000.
Watthey, Jeffrey W. H., 4,515,792, Cl. 514-214.000.

Cincinnati Milacron Inc.: *See—*
Bone, Kendall F., 4,516,044, Cl. 310-64.000.

Cioca, Gheorghe, to Seton Company. Collagen-thrombin compositions. 4,515,637, Cl. 424-94.000.

Cipriani, Aldo: *See—*
Mazzola, Massimo; and Cipriani, Aldo, 4,515,908, Cl. 521-182.000.

Citizen Watch Company Limited: *See—*
Sakuyama, Masao, 4,516,120, Cl. 340-785.000.

Clark, Graeme M.: *See—*
Patrick, James F.; Seligman, Peter; Tong, Yit C.; and Clark, Graeme M., 4,515,158, Cl. 128-419.00R.

Clarkson, Donald J.: *See—*
Bownass, Norris; and Clarkson, Donald J., 4,515,184, Cl. 137-625.660.

Clasicon (Proprietary) Limited: *See—*
Vivier, Jacobus L., 4,515,689, Cl. 209-453.000.

Clausen, Peter J. M.: *See—*
Petersen, Jorgen H.; Clausen, Peter J. M.; and Rasmussen, Hilmar O., 4,515,555, Cl. 431-208.000.

Clegg, Joe D., to Shell Oil Company. Multi-chamber gas anchor. 4,515,608, Cl. 55-193.000.

Click, Gaylon T.; and Barone, Bruno J., to Denka Chemical Corporation. Steam regeneration of phosphorus treated vanadium-phosphorus-oxygen catalysts. 4,515,899, Cl. 502-35.000.

Cline, Harvey E., to General Electric Company. Method for making semiconductor devices utilizing eutectic masks. 4,515,654, Cl. 156-656.000.

Cobbledick, David S., to GenCorp Inc. In-mold coating composition. 4,515,710, Cl. 252-511.000.

Cobbs, Walter H., Jr.; and Rehman, William R., to Nordson Corporation. Process for coating substrates with aqueous polymer dispersions. 4,515,836, Cl. 427-425.000.

Cockhill, Thomas D.: *See—*
Prewett, Phillip D.; Jefferies, Derek K.; Pashley, Neil A.; and Cockhill, Thomas D., 4,516,052, Cl. 313-546.000.

Codella, Michael: *See—*
Melillo, Anthony; and Gabriele, Louis, 4,515,361, Cl. 272-93.000.

Cody, Ian A., to Exxon Research & Engineering Co. Catalytic dewaxing using collapsed large pore zeolites. 4,515,681, Cl. 208-111.000.

Coffey, Fred S.: *See—*
Stotler, David V.; and Coffey, Fred S., 4,515,613, Cl. 65-4.400.

Cohen, Carole. Multiple-use sports bag and method of converting it to a backpack. 4,515,300, Cl. 224-151.000.

Coinamatic Leasing Corporation: *See—*
Prisant, Simon, 4,515,261, Cl. 194-1.00A.

Colbry, Norman: *See—*
Werbel, Leslie M.; Colbry, Norman; Turner, William; and Worth, Donald F., 4,515,793, Cl. 514-252.000.

Cole, Bill W.: *See—*
Brooks, Gary T.; and Cole, Bill W., 4,515,924, Cl. 525-432.000.

Cole, Roderick: *See—*
Vosmeyer, Wilhelm; Cole, Roderick; and Slezak, Pavel J., 4,515,111, Cl. 123-41.610.

Coleman Company, Inc., The: *See—*
Steffes, William J., 4,515,421, Cl. 312-351.000.
Zwick, David J., 4,515,394, Cl. 280-764.100.

Coles, Robert F., to Minnesota Mining and Manufacturing Company. Isoindoline cationic dyes. 4,515,955, Cl. 548-150.000.

Combustion Engineering, Inc.: *See—*
Creek, Ronald B.; Harden, Charles T.; and Harris, Harold H., 4,515,747, Cl. 376-249.000.
Wheeler, Louis B., 4,514,888, Cl. 29-227.000.

Comer, Philip L., to McGraw-Edison Company. High capacity filter for floor cleaning machines and the like. 4,514,875, Cl. 15-349.000.

Commonwealth of Australia Secretary of Industry and Commerce, The: *See—*
Patrick, James F.; Seligman, Peter; Tong, Yit C.; and Clark, Graeme M., 4,515,158, Cl. 128-419.00R.

CommScope Company: *See—*
Gupta, Chakra V., 4,515,992, Cl. 174-102.00R.

Compagnie d'Informatique Militaire Spatiale & Aeronautique-CIMSA-25: *See—*
Chevrel, Roger; Attard, Michel; and Leviandier, Michel, 4,515,491, Cl. 400-693.000.

Compagnie Generale des Etablissements Michelin: *See—*
Mioche, Robert, 4,515,548, Cl. 425-308.000.

Computer Basic Technology Research Assoc.: *See—*
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; and Yoshida, Toshihiro, 4,516,180, Cl. 360-126.000.

Con Rad Industries, Inc.: *See—*
Benard, Jacques A. V., 4,514,900, Cl. 29-727.000.

Conner, Donald E.; and Klein, Kenneth, to Van Dyk & Company Inc. Liquid, cinnamal dialkyl malonates as sole organic sunscreens. 4,515,774, Cl. 424-59.000.

Control Data Corporation: *See—*
Tucker, Theodore W., 4,516,029, Cl. 250-442.100.

Cook, Andrew J.; and Negus, Paul D., to Westinghouse Brake & Signal Co. Ltd. Railway signalling receiver. 4,516,249, Cl. 375-82.000.

Cook, Daniel D.: *See—*
Davern, John W.; and Cook, Daniel D., 4,515,302, Cl. 227-58.000.

Cook, Robert C., to Securitron-Magnalock Corp. Magnetic locking status detection system. 4,516,114, Cl. 340-542.000.

Cooke, Thomas W.: *See—*
Kaschig, Jurgen; Kleiner, Eduard K.; Nueller, Karl F.; and Cooke, Thomas W., 4,515,640, Cl. 106-287.250.

Coomber, Barry A.: *See—*
Phillipps, Gordon H.; Humber, David C.; Ewan, George B.; and Coomber, Barry A., 4,515,786, Cl. 514-182.000.

Cooper Industries, Inc.: *See—*
Anderson, Gene S., 4,515,435, Cl. 350-96.230.

Cooperheat: *See—*
Parker, Gary F., 4,515,559, Cl. 432-10.000.

CooperVision, Inc.: *See—*
Sorich, Richard A., 4,515,583, Cl. 604-22.000.

Cordis Corporation: *See—*
DeHaan, Abel, 4,515,873, Cl. 429-91.000.

Coret & Co. Ltd.: *See—*
Ito, Takeshi, 4,515,325, Cl. 242-84.51R.

Cormio, Ignazio, to Videocolor S.A. Process of fixing a deflection yoke onto the neck of a CRT. 4,515,568, Cl. 445-3.000.

Cornell Research Foundation, Inc.: *See—*
Kosikowski, Frank V., 4,515,815, Cl. 426-40.000.

Corsette, Douglas F. Nozzle insert for a fluid dispenser. 4,515,315, Cl. 239-491.000.

Corvari, John; Ulvr, Joseph; and Alas, Raigo, to United States of America, America Postal Service. Apparatus and process for scanning and analyzing mail information. 4,516,264, Cl. 382-46.000.

Cossar Electronics Limited: *See—*
Bond, Kevin; and Watson, Brian W., 4,516,132, Cl. 343-815.000.

Cote , Paul T., to General Electric Company. Capacitively ballasted low voltage incandescent lamp. 4,516,056, Cl. 315-240.000.

Couble, Edward C.: *See—*
Deckert, Cheryl A.; Couble, Edward C.; and Bonetti, William F., 4,515,829, Cl. 427-97.000.

Coughlin, Thomas E., to Nylco Corporation. Delsolite. 4,515,844, Cl. 428-82.000.

Coulter Corporation: *See—*
Hollinger, John D.; and Pedroso, Raul I., 4,515,274, Cl. 209-3.100.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred R.; Cahill, Lysle D.; Butler, John C.; and Basuk, Lawrence J., 4,515,879, Cl. 430-31.000.

Council, Malcolm N.: *See—*
Sizer, Phillip S.; Cox, Don C.; and Council, Malcolm N., 4,515,220, Cl. 166-384.000.

Courtaulds PLC: *See—*
Smith, John; and Boiston, David A., 4,515,210, Cl. 165-133.000.

Courtney, Thomas F., Jr.: *See—*
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,966, Cl. 549-30.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,967, Cl. 549-39.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,968, Cl. 549-39.000.

Couture, Paul A.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,514,943, Cl. 52-200.000.

Couture, Raymond; Couture, Raynald; and Poulin, Paul. Range controller for continuously monitoring the position of the boom of heavy machinery. 4,516,117, Cl. 340-685.000.

Couture, Raynald: *See—*
Couture, Raymond; Couture, Raynald; and Poulin, Paul, 4,516,117, Cl. 340-685.000.

Cox, A. Benns, II: *See—*
Smith, Robert C.; and Cox, A. Benns, II, 4,516,012, Cl. 219-400.000.

Cox, Don C.: *See—*
Sizer, Phillip S.; Cox, Don C.; and Council, Malcolm N., 4,515,220, Cl. 166-384.000.

Cox-Smith, Peter; Calvert, Colin; and Wesley, John, to Hoccum Developments Limited. Method of initiating an operation. 4,515,582, Cl. 494-7.000.

Crain, Edward: *See—*
Molitor, Edwin A.; Crain, Edward; and Lampe, Guy W., 4,515,581, Cl. 493-183.000.

Crane Cams Incorporated: *See—*
Gaterman, William C., III, 4,515,346, Cl. 251-337.000.

Creed, Gerald J., to Singer Company, The. Thread severing arrangement for thread winding bobbin. 4,515,099, Cl. 112-279.000.

Creek, Ronald B.; Harden, Charles T.; and Harris, Harold H., to Combustion Engineering, Inc. Remotely operated maintenance and inspection equipment transporter. 4,515,747, Cl. 376-249.000.

Crehan, Patrick J.: *See—*
Kennedy, Patrick B., 4,515,638, Cl. 106-162.000.

Crespo, Jorge L. N. Interlocking system for building walls. 4,514,949, Cl. 52-585.000.

Crisp, Eric H., to Spraybake Limited. Spraybooth. 4,515,072, Cl. 98-115.200.

Cristofori, Manlio: *See—*
Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, 4,515,809, Cl. 514-533.000.

Cross, Leslie E.: *See—*
Lawless, William N.; Cross, Leslie E.; and Steyert, William A., 4,515,534, Cl. 417-322.000.

Cross, Peter E.: *See—*
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,515,799, Cl. 514-341.000.

Crowcroft Engineering Limited: *See—*
Heward, Peter D.; Jones, Valerie A.; and Jones, John C., 4,515,510, Cl. 414-422.000.

Crowley, Albert T., to RCA Corporation. Frequency synthesizer using an arithmetic frequency synthesizer and plural phase locked loops. 4,516,084, Cl. 331-2.000.

Crum, Michael A., to Leggett & Platt, Incorporated. Latch for a chair's footrest assembly. 4,515,407, Cl. 297-429.000.

Cruz, Mamerto M., Jr., to Morca, Inc. Polymeric materials combined with modified hydrated magnesium aluminosilicates. 4,515,633, Cl. 106-18.260.

CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Tellone, Mauro, 4,516,166, Cl. 360-72.100.

CSP Foods Ltd.: *See—*
MacDonald, Bruce E.; Galloway, Geoffrey; and Kakuda, Yukio, 4,515,818, Cl. 426-268.000.

Culligan, John C.; Stich, Frederick A.; and Williams, Conrad F., to Siemens-Allis, Inc. Time ratio control circuit for contactor or the like. 4,516,185, Cl. 361-154.000.

Cumpston, Edward H. Hand-fired, solid fuel stove. 4,515,144, Cl. 126-58.000.

Cunningham, Earl A.; and Palmer, Dean C., to International Business Machines Corporation. Error recovery procedure using selective erasure. 4,516,165, Cl. 360-53.000.

Cupp, Carl J.: *See—*
Farrar, Frank W.; and Cupp, Carl J., 4,514,922, Cl. 42-50.000.

Currall, William J. P., to Plessey Overseas Limited. Liquid spray apparatus. 4,515,314, Cl. 239-466.000.

Currie, Corliss H. Seed drill with improved seed disc means. 4,515,224, Cl. 172-572.000.

Curtis, James J.; and Bourgo, Edward A. Knit cover for beverage container. 4,514,995, Cl. 66-170.000.

Curtis, John. Personal safety device. 4,515,240, Cl. 182-6.000.

Cushman, Barry M.: *See—*
Bleacher, John N.; and Cushman, Barry M., 4,515,867, Cl. 428-204.000.

Cuvelier, Leon, to Donaldson Company, Inc. Fluid cleaner device. 4,515,609, Cl. 55-270.000.

Cvengros, Norbert F.: *See—*
Gallatin, Paul M.; Dyken, Henry J.; and Cvengros, Norbert F., 4,516,005, Cl. 200-147.00R.

Czech, Joachim. Dispenser for paste-like products with manually actuable piston including insert device. 4,515,298, Cl. 222-380.000.

Dacomed Corporation: *See—*
Timm, Gerald W., 4,515,166, Cl. 128-694.000.

Dahlgren, Harold P. Planetary synchronizing device. 4,515,079, Cl. 101-183.000.

Dahlgren, Lennart G. O., to Victor Hasselblad Aktiebolag. Focusing hood for cameras. 4,515,454, Cl. 354-287.000.

Dahlin, Torsten: *See—*
Bobjer, Olle; Dahlin, Torsten; and Grieves, John, 4,515,070, Cl. 98-42.070.

Dahlke, Douglas F., to Marq Packaging Systems, Inc. Programmable tray forming machine. 4,516,210, Cl. 364-471.000.

Dailey, Patrick E., to Smith International, Inc. Mud energized electrical generating method and means. 4,515,225, Cl. 175-40.000.

Dainippin Ink and Chemicals Inc.: *See—*
Karino, Saburo; and Ishida, Yoshiaki, 4,515,737, Cl. 264-22.000.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Yokogawa, Kanae; Kotani, Shozo; Kawata, Shigeo; and Takase, Yoshiyuki, 4,515,891, Cl. 435-69.000.

Daitoku, Koichi: *See—*
Wakabayashi, Hiroshi; Okabe, Nobuo; and Daitoku, Koichi, 4,515,453, Cl. 354-149.100.

Danfoss A/S: *See—*
Petersen, Jorgen H.; Clausen, Peter J. M.; and Rasmussen, Hilmar O., 4,515,555, Cl. 431-208.000.

Dang, Nguyen. Two part piston assembly. 4,515,114, Cl. 123-48.00B.

Daniel, Nisim, to Abic Ltd. Automatic injection apparatus. 4,515,590, Cl. 604-144.000.

Danilevsky, Mikhail G.: *See—*
Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., 4,515,156, Cl. 128-202.260.

Dankel, Douglas D., to Roper Corporation. Log splitter having serviceable wedge assembly. 4,515,194, Cl. 144-193.00A.

Danta, William E.; and Adams, Frank H. Dielectric powder sprayer. 4,515,105, Cl. 118-629.000.

Dart Industries Inc.: *See—*
Holzl, Robert A., 4,515,860, Cl. 428-408.000.

Das, Jagabandhu; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. Intermediates and method for producing intermediates useful in the preparation of 7-oxabicycloheptane prostaglandin derivatives. 4,515,972, Cl. 549-229.000.

Data General Corporation: *See—*
Farber, David A.; Bachman, Brett; Pilat, John F.; and Wallach, Walter A., Jr., 4,516,203, Cl. 364-200.000.

Datta, Amitava: *See—*
Bose, Debasis; Datta, Amitava; DeChristofaro, Nicholas J.; and Henschel, Claude, 4,515,868, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,869, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,870, Cl. 428-656.000.

Davern, John W.; and Cook, Daniel D., to Gemcor Engineering Corp. Riveting machine. 4,515,302, Cl. 227-58.000.

Davidenko, Nikolai I.: *See—*
Gnatchenko, Viktor V.; Makarov, Nikolai P.; Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Panteleev, Valery A.; Androsenko, Alexandr P.; Davidenko, Nikolai I.; Mochalova, Zoya N.; and Palkin, Leonid N., 4,515,045, Cl. 81-429.000.

Davidson, Katharine H. Head harness for glasses. 4,515,449, Cl. 351-156.000.

Davidson, Lewis; Lees, Brian; and Lytra, Eric K., to Gestetner Manufacturing Limited. Duplicating stencil. 4,515,077, Cl. 101-127.000.

Davis, Alan R.: *See—*
Reynolds, Joseph D.; and Davis, Alan R., 4,515,029, Cl. 74-339.000.

Davis, Earl K.; Drye, James E.; and Reed, David J., to Motorola, Inc. Glass bonding means and method. 4,515,898, Cl. 501-15.000.

Davis, Gary C., to General Electric Company. Photopatternable dielectric compositions, method for making and use. 4,515,887, Cl. 430-283.000.

Deamer, David W., to University of California, The Regents of the. Method for encapsulating materials into liposomes. 4,515,736, Cl. 264-4.300.

Deans, E. Grant: *See—*
Gidden, Robert A., 4,516,213, Cl. 364-483.000.

Debourge, Jean-Claude; and Lacroix, Guy, to Rhone-Poulenc Agrochimie. Thioglycine derivatives and use as fungicides. 4,515,807, Cl. 514-513.000.

DeChristofaro, Nicholas J.: *See—*
Bose, Debasis; Datta, Amitava; DeChristofaro, Nicholas J.; and Henschel, Claude, 4,515,868, Cl. 428-656.000.

Deckers, Albert T.; and Leppink, Arie, to Oce-Nederland B.V. Apparatus for exposing and then separating superposed original and light-sensitive sheets. 4,515,470, Cl. 355-105.000.

Deckert, Cheryl A.; Couble, Edward C.; and Bonetti, William F., to Shipley Company Inc. Through-hole plating. 4,515,829, Cl. 427-97.000.

DeCristofaro, Nicholas J.: *See—*
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,869, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,870, Cl. 428-656.000.

Deering, Roland F., to Union Oil Company of California. Process for retorting oil shale with fluidized retorting of shale fines. 4,515,679, Cl. 208-11.00R.

DeGeorge Ceilings, Inc.: *See—*
Shih, Hung Y., 4,515,538, Cl. 417-572.000.

Degtev, Evgeny I.: *See—*
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; and Karavaev, Alexandr A., 4,515,157, Cl. 128-303.00R.

Degussa Aktiengesellschaft: *See—*
Domesle, Rainer; Koberstein, Edgar; Pletka, Hans-Dieter; and Voelker, Herbert, 4,515,758, Cl. 423-213.200.

DeHaan, Abel, to Cordis Corporation. Lithium cell having continuous depletion gauge. 4,515,873, Cl. 429-91.000.

Delahousse, Philippe: *See—*
Delahousse, Regis; and Delahousse, Philippe, 4,514,885, Cl. 24-557.000.

Delahousse, Regis; and Delahousse, Philippe. Clip with two stable positions of the clothes pin type. 4,514,885, Cl. 24-557.000.

Delancey, Warren H.: *See—*
Tallman, William R.; McDevitt, Steven C.; and Delancey, Warren H., 4,515,145, Cl. 126-99.00A.

Delaporte, Francois-Xavier: *See—*
Carsalade, Henri; Delaporte, Francois-Xavier; and Pantani, Jean-Pierre, 4,516,247, Cl. 375-56.000.

DeLorean, John Z. Swash plate engine. 4,515,113, Cl. 123-48.00C.

De Maria, Francesco; and Streetman, William E., to American Cyanamid Company. Hydrophilic, water-absorbing acrylonitrile polymer fiber. 4,515,859, Cl. 428-398.000.

Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corporation. Resolution of (±)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4,-b] indole-1-acetic acid using enrichment crystallization. 4,515,961, Cl. 548-432.000.

Denka Chemical Corporation: *See—*
Click, Gaylon T.; and Barone, Bruno J., 4,515,899, Cl. 502-35.000.

Dentsply Research & Development Corp.: *See—*
Gonser, Donald I., 4,516,195, Cl. 362-281.000.
Welsh, Richard E., 4,515,267, Cl. 206-219.000.

Deppisch, Gerd: *See—*
Kieser, Jorg; Kukla, Reiner; and Deppisch, Gerd, 4,515,675, Cl. 204-298.000.

Deraedt, Roger: *See—*
Teutsch, Jean G.; Deraedt, Roger; and Benzoni, Josette, 4,515,787, Cl. 514-180.000.

de Ronde, Francois: *See—*
Goscianski, Michel; and de Ronde, Francois, 4,516,089, Cl. 333-135.000.

DeRosett, William P. Canoe lantern holder. 4,515,335, Cl. 248-231.500.

Deruelle, M. Patrick: *See—*
Buguet, M. Maurice; and Deruelle, M. Patrick, 4,516,108, Cl. 338-319.000.

Despatch Industries, Inc.: *See*—
Meigaard, Hans L., 4,515,561, Cl. 432-136.000.
Deushi, Takeo: *See*—
Iwasaki, Akio; Deushi, Takeo; Watanabe, Isamu; and Mori, Toshihito, 4,515,942, Cl. 536-16.800.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Adaptive tone generator assignment in a keyboard electronic musical instrument. 4,515,058, Cl. 84-1.240.
Develop Dr. Eisbein GmbH & Co.: *See*—
Moser, Kurt; and Hofmann, Rolf, 4,515,459, Cl. 355-3.0FU.
DeVroom, William A., to American Hospital Supply Corporation. Manifold for monitoring hemodynamic pressure. 4,515,278, Cl. 211-107.000.
Dew, Brock S.; and Greiff, Paul, to Charles Stark Draper Laboratory, Inc., The. Spatially integral, video signal processor. 4,516,263, Cl. 382-41.000.
de Winter, Dirk M., to Brunswick Corporation. Gas separating and venting filter. 4,515,606, Cl. 55-159.000.
Dey, Arabinda N.: *See*—
Bowden, William L.; and Dey, Arabinda N., 4,515,875, Cl. 429-196.000.
Dezelan, Joseph E., to Caterpillar Tractor Co. Flow control valve assembly wth quick response. 4,515,181, Cl. 137-596.000.
Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Amidinoureas. 4,515,718, Cl. 260-239.00B.
Diaz, Zaida, to Shell Oil Company. Removal of H_2S from gaseous streams. 4,515,764, Cl. 423-573.00R.
Diepeveen, Neal, to Magnavox Government and Industrial Electronics, Co. Elevation step scanner. 4,516,159, Cl. 358-293.000.
Dietl, Josef; and Kotilge, Jorg, to Heliotronic Forschungs-und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe m.b.H. Process for the removal of the slag portion from molten mixtures of slag and silicon using a semipermeable separating wall. 4,515,600, Cl. 23-293.00R.
Dietz, Peter; Muller, Norbert W.; and Kroh, Horst F. M., to Pittler Machinenfabrik AG. Quick-change tool holder for lathes. 4,515,049, Cl. 82-36.00R.
Difflipp, Kurt; and Wanke, Johannes, to M.A.N.-Roland Druckmaschinen AG. Doctor blade drive. 4,515,078, Cl. 101-157.000.
Diffracto Ltd.: *See*—
Pryor, Timothy R., 4,515,479, Cl. 356-375.000.
Digonnet, Michel J. F.: *See*—
Shaw, Herbert J.; Chodorow, Marvin; and Digonnet, Michel J. F., 4,515,431, Cl. 350-96.150.
Dillon, Charles M.: *See*—
Sherwood, Edward F.; Orndorff, Karl B.; and Dillon, Charles M., 4,514,946, Cl. 52-211.000.
DiMarco, Louis A., to RCA Corporation. Solvent-cast capacitive high density information disc. 4,515,830, Cl. 427-122.000.
Dimond, James R.; and Bushman, James B., to Harco Corporation. Anode and connection. 4,515,669, Cl. 204-196.000.
DiMucci, Vito A.: *See*—
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,514,954, Cl. 53-53.000.
Dion, Donald F.; and Cantella, Michael J., to RCA Corporation. Compression of the dynamic range of video signals. 4,516,167, Cl. 358-160.000.
Disco Aluminum Products Co., Inc.: *See*—
Meigs, William; Guffey, David M.; and Brumfield, Donald E., 4,514,948, Cl. 52-397.000.
Dixon Industries Corporation: *See*—
Marshall, Charles R., 4,515,378, Cl. 277-152.000.
Dixon, Richard W.; Joyce, William B.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, to AT&T Bell Laboratories. Method of forming current confinement channels in semiconductor devices. 4,514,896, Cl. 29-576.00B.
Dizek, Frederick A.; Vogel, Eric S.; Tiedeman, C. John, Jr.; and Herold, Robert A., to United Technologies Corporation. Degassing metal powder. 4,515,629, Cl. 75-0.50B.
Docter, Richard: *See*—
Effinger, David D.; and Docter, Richard, 4,516,085, Cl. 331-40.000.
Dr. Ing. h.c.F. Porsche AG: *See*—
Kessler, Jochen, 4,515,126, Cl. 123-401.000.
Dr. Ing. Rudolf Hell GmbH: *See*—
Hennig, Eberhard; Klie, Juergen; and Wellendorf, Klaus, 4,516,155, Cl. 358-80.000.
Jung, Eggert; and Wadle, Heinrich, 4,516,175, Cl. 358-283.000.
Dodds, Robert E.; and Harrigan, David J., to GTE Products Corporation. Method of vapor coating phosphor particles. 4,515,827, Cl. 427-68.000.
Doehler, Joachim: *See*—
Fournier, Eugene; and Doehler, Joachim, 4,515,107, Cl. 118-718.000.
Doell, Aubrey C., to Bristol Fiberlite Industries. Skylight and mounting therefor. 4,514,944, Cl. 52-200.000.
Dofke, Harald: *See*—
Muller, Rudolf; Radeklau, Hans-Jurgen; Dofke, Harald; and Krieger, Detlef, 4,515,483, Cl. 366-303.000.
Dohi, Takashi: *See*—
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,516,061, Cl. 318-561.000.
Dolezal, George E.; and Kelly, Joseph L., Jr., to Hughes Tool Company - USA. Air groove scraper. 4,515,228, Cl. 175-313.000.
Dolgirev, Jury E.: *See*—
Maidanik, Jury F.; Vershinin, Sergei V.; Kholodov, Valery F.; and Dolgirev, Jury E., 4,515,209, Cl. 165-104.220.
Doman, Glidden S., to United Technologies Corporation. Minimization of the effects of yaw oscillations in wind turbines. 4,515,525, Cl. 416-11.000.
Domesle, Rainer; Koberstein, Edgar; Pietka, Hans-Dieter; and Voelker, Herbert, to Degussa Aktiengesellschaft. Process and catalyst for the reduction of the ignition temperature of diesel soot filtered out of the exhaust gas of diesel engines. 4,515,758, Cl. 423-213.200.
Donaldson Company, Inc.: *See*—
Cuvelier, Leon, 4,515,609, Cl. 55-270.000.
Wolde-Michael, Girma, 4,515,607, Cl. 55-166.000.
Donn Incorporated: *See*—
Menchetti, Robert J.; and Sauer, Gale E., 4,514,945, Cl. 52-202.000.
Dopfer, Peter; Ostermeier, Johann; and Schwerin, Siegfried, to Hoechst Aktiengesellschaft. Azo pigment formulations. 4,515,639, Cl. 106-288.00Q.
Doriath, Gerard; and Gaudry, Roger, to Thomson-CSF. Magnetometer probe using a thin-film magnetic material as a magneto-optic sensor. 4,516,073, Cl. 324-244.000.
Dorsch, Robert; and Matusz, Arnold J., to Alpha-Debon Industries, Inc. Air scrubbing system. 4,515,073, Cl. 98-115.200.
Dotson, Jarvis L., to Gulf & Western Manufacturing Company. Vehicle parking brake self-adjusting control mechanism. 4,515,036, Cl. 74-535.000.
Dougherty, Delford O., to St. Luke's Hospital. Eye dropper with light source. 4,515,295, Cl. 222-113.000.
Douglas, George H.: *See*—
Diamond, Julius; and Douglas, George H., 4,515,718, Cl. 260-239.00B.
Dow Chemical Company, The: *See*—
Behr, Raymond D., 4,515,647, Cl. 156-91.000.
Bissonnette, Harold S., 4,515,218, Cl. 166-328.000.
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,515,989, Cl. 568-674.000.
Hefner, Robert E., Jr., 4,515,934, Cl. 528-92.000.
Kleschick, William A., 4,515,956, Cl. 548-230.000.
McCullough, Thomas W.; and Stevens, Bradley D., 4,515,907, Cl. 521-139.000.
McKinney, Linda M.; and McKinney, Osborne K., 4,515,846, Cl. 428-95.000.
Simon, Jaime; Wilson, David A.; and Volkert, Wynn A., 4,515,767, Cl. 424-1.100.
Swearingen, Loren L.; and LaTulip, Randy J., 4,515,938, Cl. 528-252.000.
Tsurumi, Michio; and Lee, Do I., 4,515,914, Cl. 523-201.000.
Doyen, Daniel, to U.S. Philips Corporation. Magnetic circuit for an yttrium-iron garnet crystal resonator for an oscillator. 4,516,096, Cl. 333-219.000.
Drabek, Jozef: *See*—
Boger, Manfred; and Drabek, Jozef, 4,515,798, Cl. 514-341.000.
Dragone, Corrado, to AT&T Bell Laboratories. Antenna arrangements using focal plane filtering for reducing sidelobes. 4,516,130, Cl. 343-781.00P.
Draper, David L., to Cars & Concepts, Inc. Method of conversion of vehicle bodies. 4,514,891, Cl. 29-401.100.
Dremann, George H.: *See*—
Johnson, Ray M.; and Dremann, George H., 4,516,088, Cl. 333-22.00F.
Dresser Europe S.A.: *See*—
Parrott, George A., 4,515,409, Cl. 299-43.000.
Dresser Industries, Inc.: *See*—
Loy, Robert E.; Phillips, Dale R.; and Willis, Paul E., 4,515,234, Cl. 180-89.120.
Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W. Drill bit assembly with fluid separator. 4,515,229, Cl. 175-337.000.
Drye, James E.: *See*—
Davis, Earl K.; Drye, James E.; and Reed, David J., 4,515,898, Cl. 501-15.000.
D'Silva, Edmund D., to Baxter Travenol Laboratories, Inc. Peristaltic pump quick disconnect rotor assembly. 4,515,535, Cl. 417-360.000.
Dublier Scientific Limited: *See*—
Prewett, Phillip D.; Jefferies, Derek K.; Pashley, Neil A.; and Cockhill, Thomas D., 4,516,052, Cl. 313-546.000.
DuBois, R. Clark. Continuous web feeder with web cutting means. 4,515,053, Cl. 83-488.000.
Duffy, Joseph J.: *See*—
Varallo, Thomas P.; Ervine, Albert W. G.; Duffy, Joseph J.; and Olson, Edwin G., 4,514,956, Cl. 53-148.000.
Dungill, Kenneth F. Amalgam carrier. 4,515,563, Cl. 433-90.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bayan, Ghawamedin, 4,515,858, Cl. 428-364.000.
Carney, Thomas E.; Champion, Allan R.; and Logullo, Francis M., Sr., 4,515,636, Cl. 106-90.000.
Hoorn, Willem A., 4,514,958, Cl. 53-266.00R.
Memeger, Wesley, Jr., 4,515,656, Cl. 162-101.000.
Plotzker, Irene G., 4,515,761, Cl. 423-240.000.
Reap, James J., 4,515,624, Cl. 71-92.000.
Varallo, Thomas P.; Ervine, Albert W. G.; Duffy, Joseph J.; and Olson, Edwin G., 4,514,956, Cl. 53-148.000.
Duracell Inc.: *See*—
Bowden, William L.; and Dey, Arabinda N., 4,515,875, Cl. 429-196.000.
Durette, Philippe L.: *See*—
Yang, Shu S.; Beattie, Thomas R.; Durette, Philippe L.; Gallagher, Timothy F.; and Shen, Tsung-Ying, 4,515,722, Cl. 260-403.000.

Durkee, David B.; Koller, James P.; and Wentzel, Robert M., to AT&T Teletype Corporation. Print head actuator for an ink jet printer. 4,516,140, Cl. 346-140.00R.

Durville, Gerard A.; and Bucher, Robert R., to Textilma Ag. Loom heald control means. 4,515,186, Cl. 139-455.000.

DuVal, Daniel A.; Kahn, Roger N.; and Myers, David E. Method and apparatus for displaying records. 4,515,396, Cl. 281-15.00R.

Duverger, Jean, to Black & Decker, Inc. Electric motor with two directions of rotation and shiftable brushes. 4,516,047, Cl. 310-230.000.

Dyke, Denis G., to American Sterilizer Company. Pore forming sterilization bag. 4,515,841, Cl. 428-35.000.

Dyken, Henry J.: *See—*
Gallatin, Paul M.; Dyken, Henry J.; and Cvengros, Norbert F., 4,516,005, Cl. 200-147.00R.

Dynamit Nobel Aktiengesellschaft: *See—*
El-Chahawi, Moustafa, 4,515,984, Cl. 560-183.000.

Dyonics, Inc.: *See—*
Prescott, Rochelle; and Leiner, Dennis C., 4,515,444, Cl. 350-413.000.

E.I. Du Pont de Nemours and Company: *See—*
Knupp, John L., Jr., 4,515,695, Cl. 210-634.000.

E. R. Squibb & Sons, Inc.: *See—*
Das, Jagabandhu; and Haslanger, Martin F., 4,515,972, Cl. 549-229.000.

E-Systems, Inc.: *See—*
Barclay, Thomas E.; and Zett, John A., 4,516,248, Cl. 375-76.000.

Eastin, John A. Manufacturing and using nitrogen fertilizer solutions on a farm. 4,515,615, Cl. 71-54.000.

Eastman Kodak Company: *See—*
Harvey, Donald M., 4,515,457, Cl. 354-443.000.
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,515,947, Cl. 544-295.000.

Eaton Corporation: *See—*
Chen, Chee G., 4,516,112, Cl. 340-365.00R.
Jaskolski, Stanley V.; Schutten, Herman P.; Spellman, Gordon B.; Sedivy, Jan K.; and Jensen, Maurice W., 4,516,144, Cl. 357-27.000.
Reynolds, Joseph D.; and Davis, Alan R., 4,515,029, Cl. 74-339.000.

Eckert, Alton B., to Pitney Bowes Inc. Date checking device for electronic postage meter. 4,516,014, Cl. 235-101.000.

Economy, James; and Flandera, Mary A., to International Business Machines Corporation. Planarization method. 4,515,828, Cl. 427-82.000.

Ecopool Design Limited: *See—*
Bastenhof, Dirk, 4,515,500, Cl. 405-79.000.

Eden, Dayton D., to LTV Aerospace and Defense Company. Scanning laser radar. 4,515,471, Cl. 356-5.000.

Eder, Helmut, to Multisafe AG. Guard grid for a passageway. 4,514,951, Cl. 52-660.000.

Edixhoven, Gerardus H., to Hunter Douglas International N.V. Unit for positioning a venetian blind ladder and for guiding the slats of the blind thereonto. 4,514,886. Cl. 29-24.500.

Edmunds, Robert H.; and Vanek, Jay D., to Vapor Corporation. Pressure relief valve with adjustment for set pressure. 4,515,179, Cl. 137-543.130.

Edna McConnell Clark Foundation: *See—*
Werbel, Leslie M.; Colbry, Norman; Turner, William; and Worth, Donald F., 4,515,793, Cl. 514-252.000.

Edwards, Eldon R.: *See—*
Parquet, Donald J.; Brown, Thomas R.; and Edwards, Eldon R., 4,515,520, Cl. 414-718.000.

Edwards, Robert C., to Standard Oil Company (Indiana). Catalysts for the production of maleic anhydride by the oxidation of butane. 4,515,904, Cl. 502-209.000.

Eertink, Bastiaan B. B.; and van Esch, Hendrikus J., to Oce-Nederland B.V. Light detector circuit. 4,516,019, Cl. 250-214.0RC.

EFCO, Inc.: *See—*
Korytko, Myron I., 4,515,551, Cl. 425-406.000.

Effinger, David D.; and Docter, Richard, to Hughes Aircraft Company. Microwave frequency synthesizer using plural switchable low noise oscillators. 4,516,085, Cl. 331-40.000.

Ehrlichmann, Merlin W., to Sunburst Laboratories, Inc. Incinerator having kinetic venturi isothermic grid burner system. 4,515,089, Cl. 110-235.000.

Eichinger, Johann, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Differential coupling. 4,515,573, Cl. 464-69.000.

Eing A., Hubert I.; and Klein, Rolf D. Access control of data transmission network. 4,516,205, Cl. 364-200.000.

Eisenberg, Naphtali: *See—*
Bodenheimer, Joseph S.; and Eisenberg, Naphtali, 4,516,018, Cl. 250-203.00R.

Eisenlohr, Karl-Heinz; Gaensslen, Hans; Kriebel, Manfred; and Tanz, Heiner, to Metallgesellschaft Aktiengesellschaft. Process of producing a synthesis gas which has a low inert gas content. 4,515,604, Cl. 48-197.00R.

Elattar, Azza A., to Texaco Inc. Method of preparing pillared, interlayered clay catalyst using soluble carbohydrates. 4,515,901, Cl. 502-63.000.

El-Chahawi, Moustafa, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of alkali-metal formyl acid esters. 4,515,984, Cl. 560-183.000.

Electric Power Research Institute, Inc.: *See—*
Park, Dong-Sil; and Zabala, Robert J., 4,515,865, Cl. 428-610.000.

ELECTRICITE DE FRANCE Service National: *See—*
Fabregue, Jean-Pierre, 4,515,748, Cl. 376-250.000.

Electro-Nite Co.: *See—*
Cassidy, John E.; and Jones, L. Raymond, Jr., 4,515,485, Cl. 374-157.000.

Electrolytic Zinc Company of Australasia Limited: *See—*
Matthew, Ian G.; Pammenter, Robert V.; and Kershaw, Mervyn G., 4,515,696, Cl. 210-713.000.

Electronic Concepts, Inc.: *See—*
Lavene, Bernard, 4,516,187, Cl. 361-309.000.

Eli Lilly and Company: *See—*
Burow, Kenneth W., Jr., 4,515,625, Cl. 71-92.000.
McShane, Lawrence J., 4,515,719, Cl. 260-239.00A.
Robertson, David W., 4,515,796, Cl. 514-303.000.

Elkem a/s: *See—*
Sandvik, Johannes, 4,515,329, Cl. 242-157.100.

Ellenberger & Poensgen GmbH: *See—*
Krasser, Fritz; and Kinner, Josef, 4,516,098, Cl. 335-35.000.

Elliott, John Q., to Arkansas Medical Research & Development Corporation. Skin tumor removal and healing compositions and processes. 4,515,779, Cl. 424-145.000.

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Elmaleh, Samuel; and Grasmick, Alain D., to Gozal, David. Method for flocculating microscopic particles in suspension in a liquid and application to the collection of phytoplankton microalgae and zooplankton and for the purification of used water. 4,515,697, Cl. 210-768.000.

Elmore, Carl L.; and Funk, Erwin D., to Kamyr, Inc. Dehydration of lignite or the like. 4,514,910, Cl. 34-15.000.

Eltech systems Corporation: *See—*
Platek, Gary F.; and Krug, Geoffrey P., 4,515,672, Cl. 204-269.000.

Embelton-Grail, Inc.: *See—*
Grail, Donald J., 4,514,947, Cl. 52-536.000.

Emert, Anton; Knabel, Walter; and Richert, Manfred, to Marker International. Ski brake. 4,515,388, Cl. 280-605.000.

Emery, Jared M.; and Chan, Raymond Y., to Baylor College of Medicine. Mitotic inhibitors preventing posterior lens capsule opacification. 4,515,794, Cl. 514-249.000.

Emmerich, Kenneth C.: *See—*
Means, Thomas C.; and Emmerich, Kenneth C., 4,515,230, Cl. 175-410.000.

Emms, Norman R., to Hestair Kiddicraft Limited. Floatable toys. 4,515,572, Cl. 446-153.000.

Emori, Hiroshi: *See—*
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.

Endo, Tomohiro: *See—*
Taniguchi, Nobuhiro; and Endo, Tomohiro, 4,515,776, Cl. 424-85.000.

Energy Conversion Devices, Inc.: *See—*
Carroll, Robert, 4,515,165, Cl. 128-664.000.

Engel, Friedrich: *See—*
Stumpfl, Werner; Bettinger, Gunter; Engel, Friedrich; Fitterer, Horst; Kreimes, Norbert; Pfefferkorn, Dietmar; Schaffer, Norbert; and Schmidts, Kurt, 4,515,331, Cl. 242-199.000.

Engels, Bernd: *See—*
Kluting, Bernd; and Engels, Bernd, 4,515,339, Cl. 248-543.000.

Enomoto, Kiyoshige; and Iwata, Masao, to Oppama Kogyo Kabushiki Kaisha. Contactless ignition device for internal combustion engines. 4,515,140, Cl. 123-603.000.

Enomoto, Yuji: *See—*
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.

Envirotech Corporation: *See—*
Haymore, Ralph B.; and Winter, Heinz W., 4,515,694, Cl. 210-531.000.

Equipment Systems & Devices, Inc.: *See—*
Wilfong, Evan C.; and Anno, Tesfaye, 4,515,262, Cl. 194-1.00G.

Erickson, Bruce W., to Rockefeller University, The. Synthesis of peptides and proteins. 4,515,920, Cl. 525-54.110.

Erickson, Donald A., to Texas Instruments Incorporated. High density bipolar ROM having a lateral PN diode as a matrix element and method of fabrication. 4,516,223, Cl. 365-175.000.

Erickson, Wade A. Hand operated weeding device with operating depth stabilizer plate and weed displacer strip. 4,515,223, Cl. 172-372.000.

Eriksson, Jan. Device for processing trees or the like. 4,515,192, Cl. 144-2.00Z.

Ernest, Ivan: *See—*
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,515,717, Cl. 260-239.00A.

Ernst Wagner KG-Fordertechnik: *See—*
Schumacher, Karl, 4,515,380, Cl. 280-93.000.

Ervine, Albert W. G.: *See—*
Varallo, Thomas P.; Ervine, Albert W. G.; Duffy, Joseph J.; and Olson, Edwin G., 4,514,956, Cl. 53-148.000.

Escarabajal, Gislain; and Maligne, Jean-Charles, to Societe Anonyme D.B.A. Spring for pads of a disc brake with a sliding calliper, and disc brake equipped with such a spring. 4,515,249, Cl. 188-73.380.

Eschke, Bernd: *See—*
Bolle, Gunter; Bragas, Peter; and Eschke, Bernd, 4,515,994, Cl. 179-2.00R.

Esswein, Karlheinz, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Attachment of microscope objectives. 4,515,439, Cl. 350-257.000.

Etablissement E. Ferron: *See*—
Ferron, Ernest, 4,515,061, Cl. 84-394.000.

Ethyl Corporation: *See*—
Laurent, Sebastian M.; and Pond, Wilson G., 4,515,780, Cl. 424-154.000.
Ranken, Paul F.; and Walter, Thomas J., 4,515,945, Cl. 544-94.000.

Ettinger, Robert H.: *See*—
Komanduri, Ranga; Ettinger, Robert H.; Casey, Morton P., Jr.; and Reed, William R., Jr., 4,515,047, Cl. 82-1.00C.

Euscher-Klingenhagen, Werner; Griemla, Horst; and Rodekamp, Hartmut, to Ewald Euscher. Valve plates for container valves and method of manufacturing same. 4,515,285, Cl. 220-288.000.

Everett, George S., to QO Chemicals, Inc. Catalysts for foundry core binders. 4,515,935, Cl. 528-141.000.

Ewald Euscher: *See*—
Euscher-Klingenhagen, Werner; Griemla, Horst; and Rodekamp, Hartmut, 4,515,285, Cl. 220-288.000.

Ewald, Jerome T.: *See*—
Brown, Arthur K.; Fulmer, Keith H.; and Ewald, Jerome T., 4,514,981, Cl. 60-547.100.

Ewan, George B.: *See*—
Phillipps, Gordon H.; Humber, David C.; Ewan, George B.; and Coomber, Barry A., 4,515,786, Cl. 514-182.000.

Ex-Cell-O Corporation: *See*—
Nord, Keith W., 4,515,039, Cl. 74-665.00C.

Exxon Research & Engineering Co.: *See*—
Cody, Ian A., 4,515,681, Cl. 208-111.000.
Haslegrave, John A.; and Sullivan, Daniel S., 4,515,708, Cl. 252-390.000.

Ezzell, Bobby R.; Carl, William P.; and Mod, William A., to Dow Chemical Company, The. Preparation decarboxylation and polymerization of novel acid flourides and resulting monomers. 4,515,989, Cl. 568-674.000.

Faba, Eusebio M.: *See*—
Caldero Ges, Jose M.; and Faba, Eusebio M., 4,515,806, Cl. 514-471.000.

Fabregue, Jean-Pierre, to ELECTRICITE DE FRANCE Service National. Apparatus for detection of losses in a vapor generator. 4,515,748, Cl. 376-250.000.

Fabris, Alfonso V.; Strickland, Robert M., Jr.; and Toth, John T., to Satellite Business Systems. Teleconferencing method and system. 4,516,156, Cl. 358-85.000.

Facto, Archibald R. Coin operated mechanism for opening the door of a cabinet. 4,515,263, Cl. 194-1.00D.

Fair, David L.; Justice, David D.; and Kelly, Pilar P., to Olin Corporation. Method of stabilizing metal-silica complexes in alkali metal halide brines. 4,515,665, Cl. 204-98.000.

Fairchild Camera & Instrument Corporation: *See*—
Phy, William S., 4,515,662, Cl. 204-15.000.

Fairclough Civil Engineering Limited: *See*—
Thomas, Norman S., 4,515,501, Cl. 405-153.000.

Falch, Sverre, to A/S Moelven Brug. Rotatable crane apparatus for a rescue vehicle. 4,515,282, Cl. 212-254.000.

Falk, Volker: *See*—
Bernhagen, Wolfgang; Falk, Volker; Springer, Helmut; Weber, Jurgen; Wiebus, Ernst; and Kniep, Claus, 4,515,986, Cl. 564-471.000.

Fancher, Llewellyn W.; and Scher, Herbert B., to Stauffer Chemical Company. Lepidoptericidal isothiourea compounds. 4,515,813, Cl. 514-563.000.

Fansteel Inc.: *See*—
Means, Thomas C.; and Emmerich, Kenneth C., 4,515,230, Cl. 175-410.000.

Farah, Robert L.; and Walters, Stephen M., to AT&T Bell Laboratories. Bit compression coding with embedded signaling. 4,516,241, Cl. 370-110.100.

Farber, David A.; Bachman, Brett; Pilat, John F.; and Wallach, Walter A., Jr., to Data General Corporation. Improved apparatus for encaching data whose value does not change during execution of an instruction sequence. 4,516,203, Cl. 364-200.000.

Farcy, Andre : *See*—
Peynaud, Francois; Gosselin, Jean; Farcy, Andre ; and Grandvaux, Bernard, 4,516,226, Cl. 367-6.000.

Farrar, Frank W.; and Cupp, Carl J., to Pachmayr Gun Works, Inc. Gun magazine structure. 4,514,922, Cl. 42-50.000.

Fauss, Rudolf; Meiners, Hans J.; Rasshofer, Werner; and Meyborg, Holger, to Bayer Aktiengesellschaft. Polyamines and a process for their production. 4,515,923, Cl. 525-127.000.

Fayter, Richard G., Jr.: *See*—
Harris, Eugene G.; and Fayter, Richard G., Jr., 4,515,978, Cl. 549-484.000.

Fedorov, Svyatoslav N.; Degtev, Evgeny L; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; and Karavaev, Alexandr A., to Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza. Corneal incision marker. 4,515,157, Cl. 128-303.00R.

Feller, Ron; and Mizrach, Amos, to State of Israel, Ministry of Agriculture, The. Separation devices employing forced air through conveyor belt means. 4,515,276, Cl. 209-693.000.

Felten & Guilleaume Carlswerk Aktiengesellschaft: *See*—
Schmidt, Bernhard, 4,515,433, Cl. 350-96.210.

Fenneman, David B.; Rinehart, Larry F.; and Hardesty, Leonard W., Jr., to United States of America, Navy. Apparatus for and a method of measuring the intrinsic time constant of liquids. 4,516,077, Cl. 324-425.000.

Ferber, John G.; Goddard, Peter J.; and Holden, Robert S., to Bush Boake Allen Limited. Preparation of indanes, tetralins and phenyl alcohol in Friedel Craft reaction. 4,515,990, Cl. 568-808.000.

Ferguson, Donald A.: *See*—
Jenkins, Patrick A.; and Ferguson, Donald A., 4,515,012, Cl. 73-168.000.

Ferlan, Stephen J.; and Gesinski, Leonard T., to Westinghouse Electric Corp. Spring clip inserter tool. 4,514,889, Cl. 29-229.000.

Ferrante, Mario, to Photomeca S.A. Tank for the treatment of offset plates by ultrasounds. 4,515,456, Cl. 354-320.000.

Ferron, Ernest. Wind instrument with adjustable tone. 4,515,060, Cl. 84-380.00R.

Ferron, Ernest, to Etablissement E. Ferron. Trumpet with improved tone. 4,515,061, Cl. 84-394.000.

Fetty, James R. Radial universal tool. 4,515,191, Cl. 144-1.00C.

Fev Forschungsgesellschaft fur Energietechnik und ver Brennungsmotoren mbH: *See*—
Pischinger, Franz; and Kreuter, Peter, 4,515,343, Cl. 251-48.000.

Fides Treuhand GmbH: *See*—
Mohr, Ernst, 4,514,979, Cl. 60-512.000.

Field, John R.; Kocher, Haribhajan S.; and Martellock, Arthur C., to Xerox Corporation. Fusing system with unblended silicone oil. 4,515,884, Cl. 430-99.000.

Filatov, Vladimir N.: *See*—
Markov, Vladimir A.; Filatov, Vladimir N.; Kernasovsky, Ilya S.; and Gorina, Ljudmila V., 4,515,254, Cl. 188-371.000.

Filimonovna, Ljudmila Y.: *See*—
Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., 4,515,156, Cl. 128-202.260.

Findakly, Talal K., to TRW Inc. Integrated optical star coupler. 4,515,428, Cl. 350-96.120.

Fine, Daniel H. Composition and method for the preventative treatment of dental disease and apparatus for dispensing said composition. 4,515,771, Cl. 424-52.000.

Fischer, William H., to Opcon, Inc. Ball and socket mount for optical sensing system source and/or detector devices. 4,515,336, Cl. 248-288.300.

Fisher, Jared D.: *See*—
Fisher, Susan S.; and Fisher, Jared D., 4,514,871, Cl. 5-508.000.

Fisher, Richard K., Jr., to Allis-Chalmers Corporation. Draft tube for hydraulic turbine. 4,515,524, Cl. 415-219.00R.

Fisher, Susan S.; and Fisher, Jared D. Waterbed convertible cap. 4,514,871, Cl. 5-508.000.

Fishler, Jay. Article dispensing apparatus. 4,515,290, Cl. 221-124.000.

Fisons plc: *See*—
Newman, Peter M.; and Jenkins, Anthony W., 4,515,805, Cl. 514-460.000.

Fitch, John L.; and Strubhar, Malcolm K., to Mobil Oil Corporation. Method for controlling the vertical growth of hydraulic fractures. 4,515,214, Cl. 166-250.000.

Fitterer, Horst: *See*—
Stumpfi, Werner; Bettinger, Gunter; Engel, Friedrich; Fitterer, Horst; Kreimes, Norbert; Pfefferkorn, Dietmar; Schaffer, Norbert; and Schmidts, Kurt, 4,515,331, Cl. 242-199.000.

Flandera, Mary A.: *See*—
Economy, James; and Flandera, Mary A., 4,515,828, Cl. 427-82.000.

Flaum, Stephen S., to S&S Corrugated Paper Machinery Co., Inc. Automatic slitter. 4,515,052, Cl. 83-479.000.

Flax, Stephen W.; and Pelc, Norbert J., to General Electric Company. Method and a means for determining ultrasonic wave attenuation in tissue using zero crossing detector functioning within a specified frequency band. 4,515,163, Cl. 128-660.000.

Fledrich, Istvan: *See*—
Varga, Laszlo ; Krekacs, Sandor; Latorcai, Janos; Palfi, Zoltan; and Fledrich, Istvan, 4,514,911, Cl. 34-22.000.

Flegel, Martin; Krojidlo, Milan; Kolinsky , Jiri ; Masek, Karel; and Seifert, Jaroslav, to SPOFA, spojene podniky pro zdratvonickou vyrobu. L-Alanyl-D-isoglutamine adamantylamide. 4,515,715, Cl. 260-112.50R.

FMC Corporation: *See*—
Gunnarsson, Arne N., 4,515,381, Cl. 280-96.000.
LeDevehat, Eugene R., 4,515,182, Cl. 137-614.060.
Rathe, Robert A.; and Volkmann, Thomas J., 4,514,939, Cl. 52-118.000.

Fong, Dodd W., to Nalco Chemical Company. Retention aids. 4,515,658, Cl. 162-168.400.

Ford Aerospace & Communications Corporation: *See*—
Pizzurro, Vito F., 4,515,082, Cl. 102-293.000.

Ford Motor Company: *See*—
Anderson, Robert L.; and McDonald, William R., 4,515,132, Cl. 123-494.000.
Holubka, Joseph W., 4,515,926, Cl. 525-449.000.
Janson, David A., 4,515,031, Cl. 74-359.000.
McCarthy, James P.; and Byler, Richard E., 4,515,176, Cl. 137-115.000.
Swider, Robert A.; and Horsch, Martha E., 4,515,911, Cl. 523-414.000.
Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., 4,515,659, Cl. 201-2.500.

Forenade Fabriksverken: *See*—
Sundvall, Kenneth, 4,515,081, Cl. 102-266.000.

Forsell, Glenn W. Method and apparatus for trimming lead wires projecting from printed circuit boards. 4,515,048, Cl. 83-13.000.

Forshey, Terry L.: *See*—
Isenberg, Gerry E.; Forshey, Terry L.; and Keller, Robert D., Jr., 4,515,353, Cl. 266-236.000.

Forsyth, John L.: *See*—
Sanders, Royden C., Jr.; and Forsyth, John L., 4,515,488, Cl. 400-124.000.

Fortuna, Vincent E.: *See*—
MacLaughlin, Donald N.; and Fortuna, Vincent E., 4,515,651, Cl. 156-423.000.

Fournier, Eugene; and Doehler, Joachim, to Sovonics Solar Systems. Apparatus for the manufacture of photovoltaic devices. 4,515,107, Cl. 118-718.000.

Fox, Richard J., to United States of America, Energy. Method and apparatus for determining peak temperature along an optical fiber. 4,515,474, Cl. 356-44.000.

Fraise, Pierre, to Thomson-CSF. Microwave mixer with recovery of the sum frequency. 4,516,271, Cl. 455-327.000.

Franceschi, Jean-Luc: *See*—
Jouffrey, Bernard; Trinquier, Jacques; and Franceschi, Jean-Luc, 4,516,026, Cl. 250-310.000.

Francis, John H.: *See*—
VanDerLinden, Roy E.; and Francis, John H., 4,515,028, Cl. 74-191.000.

Frank, Andrew A.; and Omitsu, Takashi, to Aisin Seiki Kabushiki Kaisha. Control system and method for a power delivery system having a continuously variable ratio transmission. 4,515,041, Cl. 74-866.000.

Frankhouser, Paul L., to Arrow International, Inc. Catheter shield. 4,515,592, Cl. 604-163.000.

Franklin, LeRoy H., to GA Technologies Inc. Current limiting apparatus. 4,516,182, Cl. 361-13.000.

Franz, James H., Jr.: *See*—
Roberts, Richard D.; Franz, James H., Jr.; Hoffman, Lester J.; and Miller, Lalan G., 4,516,059, Cl. 318-301.000.

Frederick, Bruce A., to Advanced Micro Devices, Inc. MOS Depletion load circuit. 4,516,225, Cl. 365-203.000.

Frederick Manufacturing Company: *See*—
VanDerLinden, Roy E.; and Francis, John H., 4,515,028, Cl. 74-191.000.

Frei, Theo: *See*—
Haenni, Eduard; Frei, Theo; and Hug, Peter, 4,515,050, Cl. 83-71.000.

Freye, Theodor: *See*—
Moosbrucker, Karl; Hollmann, Bernd; and Freye, Theodor, 4,514,969, Cl. 56-341.000.

Frick Company: *See*—
Pillis, Joseph W., 4,515,540, Cl. 418-97.000.

Fricke, Richard J.: *See*—
Kennedy, Richard B., 4,515,638, Cl. 106-162.000.

Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., to Nanodata Computer Corporation. Data processing system. 4,516,199, Cl. 364-200.000.

Friesen, Dwayne; Babcock, Walter C.; and Tuttle, Mark, to Bend Research, Inc. Anisotropic microporous supports impregnated with polymeric ion-exchange materials. 4,515,906, Cl. 521-28.000.

Frigon, Raymond A.; and Kahl, William G., Jr., to Cerberus AG. Intrusion detection system. 4,516,115, Cl. 340-556.000.

Frihart, Charles R.; and Veazey, Richard L., to Union Camp Corporation. Poly(ester-amide) hot-melt adhesives. 4,515,939, Cl. 528-339.300.

Frisbie, Richard C.; Houser, David E.; Morenus, Richard J.; and Thomas, Edwin L., to International Business Machines Corporation. Pressure foot assembly for an end mill delete cutter. 4,515,505, Cl. 409-163.000.

Friz, James O. Method and apparatus for opening a loaded plastic bag and removing the contents thereof. 4,515,509, Cl. 414-412.000.

Frohberger, Paul-Ernst: *See*—
Holmwood, Graham; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,515,617, Cl. 71-76.000.
Kuhle, Engelbert; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,515,812, Cl. 514-592.000.

Frungel, Frank. Visibility meter and components used therein. 4,515,477, Cl. 356-338.000.

Fruth, Franz: *See*—
Mullritter, Ludwig; Schnall, Gunther; and Fruth, Franz, 4,515,356, Cl. 270-53.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Takano, Toshio; and Sakakiyama, Ryuzo, 4,515,257, Cl. 192-0.075.

Fuji Machine Mfg. Co., Ltd.: *See*—
Asai, Koichi; Tsuda, Mamoru; Oe, Kunio; and Muto, Yasuo, 4,515,507, Cl. 414-226.000.

Fuji Photo Film Co., Ltd.: *See*—
Kitamoto, Tatsuji; and Akashi, Goro, 4,515,857, Cl. 428-328.000.
Yamamoto, Takaaki; and Kawai, Yasuhiro, 4,516,142, Cl. 346-160.000.

Fuji Xerox Co., Ltd.: *See*—
Kume, Hiroshi; and Tan, Yoichi, 4,516,240, Cl. 370-85.000.
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihasa, 4,516,134, Cl. 346-75.000.
Todoh, Hidemasa, 4,516,135, Cl. 346-76.0PH.

Fujibayashi, Kentaro: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Fujibayashi, Kentaro, 4,516,211, Cl. 364-474.000.

Fuji, Kazuko Uchida and Chigusa, heiresses: *See*—
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.

Fujii, Kunihisa; Tomono, Noboru; Watanabe, Hajime; and Miyakoshi, Yasushi, to Takamisawa Electric Co., Ltd. Electromagnetic relay. 4,516,099, Cl. 335-135.000.

Fujii, Masahiro: *See*—
Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, 4,515,691, Cl. 210-274.000.

Fujimoto, Hiroyuki: *See*—
Nojima, Kazuhiro; Fujimoto, Hiroyuki; and Takahashi, Mikio, 4,515,833, Cl. 427-362.000.

Fujirebio Kabushiki Kaisha: *See*—
Taniguchi, Nobuhiro; and Endo, Tomohiro, 4,515,776, Cl. 424-85.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,515,788, Cl. 514-202.000.

Fujita, Kagari: *See*—
Iwataki, Isao; Fujita, Kagari; Ishikawa, Hisao; Hosaka, Hideo; and Kohara, Kenichi, 4,515,729, Cl. 260-464.000.

Fujita, Takashi: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.

Fujitsu Fanuc Limited: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Fujibayashi, Kentaro, 4,516,211, Cl. 364-474.000.

Fujitsu Limited: *See*—
Abe, Susumu; Munakata, Akio; and Kitahara, Takeshi, 4,516,173, Cl. 358-261.000.
Aoyama, Keizo, 4,516,224, Cl. 365-203.000.
Tsuchikawa, Haruo; and Kai, Junichi, 4,516,030, Cl. 250-492.200.

Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, to Toyo Jozo Kabushiki Kaisha. 23-Demycinosyldesmycosin derivatives. 4,515,941, Cl. 536-7.100.

Fujiyama, Kunio; Okamoto, Kei; and Yoshikawa, Noriyuki, to Takara Company, New York, Inc. Headrest for medical treatment chair. 4,515,406, Cl. 297-409.000.

Fukayama, Miyoji; and Ichijo, Chikara, to Toray Silicone Company, Ltd. RTV Polyorganosiloxane compositions yielding paintable elastomers. 4,515,834, Cl. 427-387.000.

Fukemoto, Hiromu. Fishing line with a reinforced leader. 4,514,927, Cl. 43-44.980.

Fukuda, Mitsutoshi: *See*—
Yamaoka, Tsuguo; and Fukuda, Mitsutoshi, 4,515,886, Cl. 430-270.000.

Fukui, Kazuyuki, to Minolta Camera Kabushiki Kaisha. Sheet feeding apparatus. 4,515,358, Cl. 271-122.000.

Fukushima, Naoto: *See*—
Hidaka, Kunihiko; Fukushima, Naoto; and Iwata, Kazuro, 4,515,252, Cl. 188-282.000.

Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, to Nippon Kokan Kabushiki Kaisha. Rotary furnace used for the production of ferrochromium. 4,515,352, Cl. 266-218.000.

Fukuta, Minoru, to Sony/Tektronix Corporation. Logic signal display apparatus. 4,516,119, Cl. 340-722.000.

Fukuyo, Hiroshi: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,515,351, Cl. 266-177.000.

Fulmer, Keith H.: *See*—
Brown, Arthur K.; Fulmer, Keith H.; and Ewald, Jerome T., 4,514,981, Cl. 60-547.100.

Funakoshi, Yasunobu: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.

Funk, Erwin D.: *See*—
Elmore, Carl L.; and Funk, Erwin D., 4,514,910, Cl. 34-15.000.

Furiate, David L. Traffic lane delineator. 4,515,499, Cl. 404-6.000.

Furubayashi, Hisatoshi; Tanaka, Junichi; Watanabe, Masanori; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Method for production of a moisture sensor. 4,515,653, Cl. 156-643.000.

Furukawa, Osamu: *See*—
Imai, Motomasa; Takahashi, Takashi; Furukawa, Osamu; and Kanai, Hideyuki, 4,516,105, Cl. 338-21.000.

Furukawa, Tokinobu: *See*—
Matsushita, Nobuo; Furukawa, Tokinobu; Shintani, Tetsuo; Sumitani, Tomoaki; and Oda, Chikao, 4,515,008, Cl. 73-53.000.

G.A. Pfleiderer GmbH & Co. KG: *See*—
Rother, Bruno; and Trommen, Hartmut, 4,515,547, Cl. 425-215.000.

G. S. Blodgett Co., Inc.: *See*—
Smith, Robert C.; and Cox, A. Benns, II, 4,516,012, Cl. 219-400.000.

GA Technologies Inc.: *See*—
Franklin, LeRoy H., 4,516,182, Cl. 361-13.000.

Gabriele, Louis: *See*—
Melillo, Anthony; and Gabriele, Louis, 4,515,361, Cl. 272-93.000.

Gaede, Hans: *See*—
Sewell, James H.; Gaede, Hans; and Ritch, Curtis R., 4,515,299, Cl. 223-76.000.

Gaeng, Manfred: *See—*
Husslein, Gerd; Hamprecht, Gerhard; Koenig, Karl-Heinz; Boehm, Walter; and Gaeng, Manfred, 4,515,985, Cl. 562-472.000.

Gaensslen, Hans: *See—*
Eisenlohr, Karl-Heinz; Gaensslen, Hans; Kriebel, Manfred; and Tanz, Heiner, 4,515,604, Cl. 48-197.00R.

Gaiser, Robert F., to Allied Corporation. Master cylinder attachment for plastic reservoir. 4,514,983, Cl. 60-562.000.

Gaiser, Robert F.: *See—*
Bach, Lloyd G.; and Gaiser, Robert F., 4,514,982, Cl. 60-562.000.

Galetta, Nicholas J. Combination boot and lockable storage means. 4,514,915, Cl. 36-1.000.

Gallagher, Timothy F.: *See—*
Yang, Shu S.; Beattie, Thomas R.; Durette, Philippe L.; Gallagher, Timothy F.; and Shen, Tsung-Ying, 4,515,722, Cl. 260-403.000.

Gallatin, Paul M.; Dyken, Henry J.; and Cvengros, Norbert F., to Siemens-Allis, Inc. Sequenced intermittent blowout coil controller. 4,516,005, Cl. 200-147.00R.

Galloway, Geoffrey: *See—*
MacDonald, Bruce E.; Galloway, Geoffrey; and Kakuda, Yukio, 4,515,818, Cl. 426-268.000.

Gallup, Michael G., to Motorola, Inc. Programmable prescaler. 4,516,251, Cl. 377-110.000.

Gantz, Jack L.: *See—*
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,515,136, Cl. 123-564.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Kaule, Wittich; Renz, Walter; and Stenzel, Gerhard, 4,516,031, Cl. 250-562.000.

Garcia, Manuel E. Board game. 4,515,370, Cl. 273-258.000.

Garde, Peter, to Unisearch Limited. High-efficiency low distortion parallel amplifier. 4,516,080, Cl. 330-3.000.

Garner, John N.; and Shannon, Michael A., to Northern Telecom Limited. Method of production of dielectric insulation layers upon electrical conductors. 4,515,826, Cl. 427-8.000.

Garrett Corporation, The: *See—*
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,515,136, Cl. 123-564.000.

Gaterman, William C., III, to Crane Cams Incorporated. Valve spring retainer assembly. 4,515,346, Cl. 251-337.000.

Gates Formed Fibre Products Inc.: *See—*
Leunig, Carl V.; and Kovar, Robert F., 4,515,848, Cl. 428-172.000.

Gattiker, Anton: *See—*
Taylor, Charles E.; Gattiker, Anton; and Krantz, Gary B., 4,515,468, Cl. 355-27.000.

Gatward, Douglas K. Sheet material. 4,515,840, Cl. 428-35.000.

Gatzke, Kenneth G.; and Winslow, John M., to Minnesota Mining and Manufacturing Company. Diazo vesicular imaging films with nitrate salt. 4,515,885, Cl. 430-175.000.

Gaudioso, Stephen L., to Xerox Corporation. Reflex imaging process with magnetic images. 4,515,880, Cl. 430-39.000.

Gaudry, Roger: *See—*
Doriath, Gerard; and Gaudry, Roger, 4,516,073, Cl. 324-244.000.

Gaylord, Norman G. Process to copolymerize vinyl chloride and chlorotrifluoroethylene. 4,515,927, Cl. 526-87.000.

Gaynor, John C.: *See—*
Cathey, Thaddeus F.; Gaynor, John C.; and Nelson, Rodney J., 4,515,577, Cl. 474-204.000.

Gealer, Roy L.: *See—*
Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., 4,515,659, Cl. 201-2.500.

Gebelius, Sven R. V. Flag-pole. 4,515,241, Cl. 182-96.000.

Geerts, Jan: *See—*
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,515,905, Cl. 502-309.000.

Gehrke, Erich F., to BTR South Africa Limited. Rail fastener assembly and components thereof. 4,515,309, Cl. 238-349.000.

Gehrke, Hans-Georg: *See—*
Nouvertne, Werner; Serini, Volker; Neuray, Dieter; Binsack, Rudolf; Gehrke, Hans-Georg; Rempel, Dieter; and Krishnai, Sivara, 4,515,918, Cl. 524-504.000.

Gehrung, Manfred; Schoettle, Klaus; Kreissler, Helmut; Rudolf, Peter; Hack, Joachim; and Anslinger, Friedrich, to BASF Aktiengesellschaft. Method for the surface treatment of magnetic recording media. 4,514,937, Cl. 51-281.0SF.

Geiger, Rolf: *See—*
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,515,803, Cl. 514-338.000.

Gemcor Engineering Corp.: *See—*
Davern, John W.; and Cook, Daniel D., 4,515,302, Cl. 227-58.000.

Gemignani, Francois. Blocking valve. 4,515,344, Cl. 251-635.000.

GenCorp Inc.: *See—*
Cobbledick, David S., 4,515,710, Cl. 252-511.000.

General American Transportation Corporation: *See—*
Mowatt-Larssen, Erling, 4,515,189, Cl. 141-11.000.

General Electric Company: *See—*
Blake, Walter R., 4,516,196, Cl. 362-311.000.
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,515,746, Cl. 264-332.000.
Chung, Rack H., 4,515,932, Cl. 528-16.000.
Cline, Harvey E., 4,515,654, Cl. 156-656.000.
Cote , Paul T., 4,516,056, Cl. 315-240.000.
Davis, Gary C., 4,515,887, Cl. 430-283.000.
Flax, Stephen W.; and Pelc, Norbert J., 4,515,163, Cl. 128-660.000.
Komanduri, Ranga; Ettinger, Robert H.; Casey, Morton P., Jr.; and Reed, William R., Jr., 4,515,047, Cl. 82-1.00C.
Kuwata, Masayoshi, 4,515,205, Cl. 165-1.000.
Love, Robert P., 4,516,143, Cl. 357-23.400.
Olson, Daniel R.; and O'Donnell, Timothy W., 4,515,931, Cl. 526-323.200.
Schoenig, Frederick C., Jr.; and Landry, James D., 4,515,749, Cl. 376-254.000.
Sikdar, Subhas K.; and Yeboah, Yaw D., 4,515,936, Cl. 528-200.000.
Young, James R., 4,515,528, Cl. 417-51.000.

General Energy Systems, Inc.: *See—*
Glass, James W., 4,515,135, Cl. 123-557.000.

General Mills, Inc.: *See—*
Blake, Jon R.; Knutson, Richard K.; and VanHulle, Glenn J., 4,515,824, Cl. 426-554.000.
Kraig, Leon; and Langenfeld, Mathew, 4,515,822, Cl. 426-445.000.

General Motors Corporation: *See—*
Hogan, Martin J., 4,515,418, Cl. 384-502.000.
Nowakowski, Robert J., 4,516,066, Cl. 320-15.000.
Stettner, Ernest R., 4,515,129, Cl. 123-472.000.

General Signal Corporation: *See—*
Schwab, Carl E.; Rost, David P.; Hackenberg, William; and Holcombe, Paul, 4,516,125, Cl. 343-7.700.

General Tire & Rubber Company, The: *See—*
Stamper, Richard W.; and Hultz, Robert C., 4,515,744, Cl. 264-171.000.

Genisis Technology, Inc.: *See—*
Schorr, Steven M.; and Stoner, Richard J., Jr., 4,514,930, Cl. 47-60.000.

Geo-Centers, Inc.: *See—*
Mermelstein, Marc D., 4,515,473, Cl. 356-33.000.

George Fischer Limited: *See—*
Thalmann, Alfred; and Reich, Fritz, 4,515,177, Cl. 137-318.000.

Gesinski, Leonard T.: *See—*
Ferlan, Stephen J.; and Gesinski, Leonard T., 4,514,889, Cl. 29-229.000.

GESIPA Blindniettechnik Gesellschaft mit beschrankter Haftung: *See—*
Klein, Gunter, 4,515,005, Cl. 72-391.000.

Gestetner Manufacturing Limited: *See—*
Davidson, Lewis; Lees, Brian; and Lytra, Eric K., 4,515,077, Cl. 101-127.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Golla, Franz, 4,514,873, Cl. 15-306.00B.
Trumper, Thomas; Schoop, Gunther-Dietmar; Borgschulte, Fritz; and Krummnack, Friedrich, 4,515,410, Cl. 299-43.000.

Gidden, Robert A., to Deans, E. Grant. Multiple rate metering system. 4,516,213, Cl. 364-483.000.

Gilbert, Curtis R. Miter gauge. 4,514,909, Cl. 33-471.000.

Gilbert, Jerry R.; Millikan, Robert C.; Wysowski, Charles H.; and Pyburn, John R., Jr., to Brown & Williamson Tobacco Corporation. Towable, hydraulically powered lifting and transport trailer. 4,515,518, Cl. 414-459.000.

Gillemot, Laszlo ; Prodan, Janos; Pataki, Endre; and Zuckermann, Erno , to Magyar Aluminiumipari Troszt. Clamping element for the releasable fastening of spatially arranged, or parallel bars, tubes and similar objects. 4,515,497, Cl. 403-391.000.

Gillette Company, The: *See—*
Bond, Michael J., 4,514,904, Cl. 30-87.000.

Gilley, James H., to AT&T Technologies, Inc. Temperature testing apparatus for an electronic circuit substrate. 4,515,484, Cl. 374-137.000.

Gillie, Raymond A., to Arvey Corporation. Method for handling envelopes. 4,514,961, Cl. 53-449.000.

Gimpelson, George E.; and Russo, Cheryl L., to Harris Corporation. Plasma sculpturing with a non-planar sacrificial layer. 4,515,652, Cl. 156-643.000.

Giorgioni, Angelo: *See—*
Missio, Bruno; and Giorgioni, Angelo, 4,515,025, Cl. 74-27.000.

Girogioni di A. Giorgioni & C. s.a.s.: *See—*
Missio, Bruno; and Giorgioni, Angelo, 4,515,025, Cl. 74-27.000.

Gist-Brocades N.V.: *See—*
Apontoweil, Peter; and Krasselt, Manfred M., 4,515,777, Cl. 424-89.000.

Giulekas, Gus: *See—*
Zapisek, John M.; and Giulekas, Gus, 4,516,040, Cl. 307-468.000.

Givaudan Corporation: *See—*
Chalk, Alan J.; and Purzycki, Kenneth L., 4,515,711, Cl. 252-522.00R.

Gladstein, Harvey. Method and apparatus for supporting logs and the like. 4,515,195, Cl. 144-366.000.

Glass, James W., to General Energy Systems, Inc. Hot fuel gas generator. 4,515,135, Cl. 123-557.000.

Glasstech, Inc.: *See—*
McMaster, Harold A.; McMaster, Robert G.; and McMaster, Ronald A., 4,515,622, Cl. 65-351.000.

Glaxo Group Limited: *See—*
Phillipps, Gordon H.; Humber, David C.; Ewan, George B.; and Coomber, Barry A., 4,515,786, Cl. 514-182.000.

Glennon, Timothy F., to Sundstrand Corporation. Triangle wave generator. 4,516,038, Cl. 307-264.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Nakamura, Minoru; and Asami, Kazuto, 4,515,172, Cl. 133-8.00A.

Gnatchenko, Viktor V.; Makarov, Nikolai P.; Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Panteleev, Valery A.; Androsenko, Alexandr P.; Davidenko, Nikolai I.; Mochalova, Zoya N.; and Palkin, Leonid N., to Spetsialnoe Konstruktorskoe

Bjuro Seismicheskoi Tekhniki. Automatic wrench for screwing a pipe string together and apart. 4,515,045, Cl. 81-429.000.
GNB Batteries Inc.: *See*—
Schaumburg, Edward G.; and Stanefski, Eugene F., 4,515,187, Cl. 141-1.000.
Goddard, Peter J.: *See*—
Ferber, John G.; Goddard, Peter J.; and Holden, Robert S., 4,515,990, Cl. 568-808.000.
Goel, Anil B.; and Pettiford, Michael E., to Ashland Oil, Inc. Manufacture of phenyl esters and phenol. 4,515,983, Cl. 560-130.000.
Goi, Kowichi: *See*—
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.
Goldstein, Gideon: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,515,893, Cl. 435-240.000.
Kung, Patrick C.; and Goldstein, Gideon, 4,515,894, Cl. 435-240.000.
Kung, Patrick C.; and Goldstein, Gideon, 4,515,895, Cl. 435-240.000.
Golla, Franz, to Gewerkschaft Eisenhutte Westfalia. Equipment for cleaning remnants of carbon blocks. 4,514,873, Cl. 15-306.00B.
Golubev, Vladimir N.: *See*—
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; and Karavaev, Alexandr A., 4,515,157, Cl. 128-303.00R.
Gomez, Abelicio. Clutch lever retaining mechanism. 4,515,533, Cl. 417-319.000.
Gonser, Donald I., to Dentsply Research & Development Corp. Multifunction dental operating light source. 4,516,195, Cl. 362-281.000.
Gonzales, Jose M. G. Game device. 4,515,372, Cl. 273-274.000.
Gonzalez, Benito: *See*—
Gonzalez, Jose; and Gonzalez, Benito, 4,515,237, Cl. 180-287.000.
Gonzalez Flores, Manuel. Aseismic sliders. 4,514,941, Cl. 52-167.000.
Gonzalez, Jose; and Gonzalez, Benito. Automobile security system. 4,515,237, Cl. 180-287.000.
Goodloe, Kent J.; and Landrum, Ralph A., Jr., to Western Geophysical Company of America. Protective drive-level limiter for an electrohydraulic vibrator. 4,516,230, Cl. 367-190.000.
Goodson, Albert A., Jr. Building framing system and method. 4,514,950, Cl. 52-648.000.
Goodyear Tire & Rubber Company, The: *See*—
Kaniecki, Michael; Landers, Samuel P.; and Botzman, Thomas J., 4,515,199, Cl. 152-353.00R.
Stanley, John H., 4,515,006, Cl. 72-402.000.
Wideman, Lawson G.; and Kuczkowski, Joseph A., 4,515,713, Cl. 260-106.000.
Gorina, Ljudmila V.: *See*—
Markov, Vladimir A.; Filatov, Vladimir N.; Kernasovsky, Ilya S.; and Gorina, Ljudmila V., 4,515,254, Cl. 188-371.000.
Gosciansky, Michel; and de Ronde, Francois, to U.S. Philips Corporation. System for receiving microwave signals having orthogonal polarizations. 4,516,089, Cl. 333-135.000.
Gosselin, Jean: *See*—
Peynaud, Francois; Gosselin, Jean; Farcy, Andre ; and Grandvaux, Bernard, 4,516,226, Cl. 367-6.000.
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., to Ciba Geigy Corporation. Thia-aza compounds with a β-lactam ring. 4,515,717, Cl. 260-239.00A.
Goto, Satoshi: *See*—
Sawada, Kiyoshi; Goto, Satoshi; Kinoshita, Akira; and Sasaki, Osamu, 4,515,881, Cl. 430-58.000.
Goto, Takahiro: *See*—
Manabe, Nobuyuki; and Goto, Takahiro, 4,515,312, Cl. 239-227.000.
Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See*—
Stehning, Werner, 4,515,754, Cl. 422-168.000.
Gozal, David: *See*—
Elmaleh, Samuel; and Grasmick, Alain D., 4,515,697, Cl. 210-768.000.
Gragson, James T.: *See*—
Schuettenberg, Alexander D.; and Gragson, James T., 4,515,740, Cl. 264-50.000.
Grail, Donald J., to Embelton-Grail, Inc. Roof tile and tile composition of matter. 4,514,947, Cl. 52-536.000.
Grainge, Richard W.; and Humphries, Rowland F., to British Aerospace Public Limited Company. Ground reconnaissance. 4,516,158, Cl. 358-109.000.
Grandvaux, Bernard: *See*—
Peynaud, Francois; Gosselin, Jean; Farcy, Andre ; and Grandvaux, Bernard, 4,516,226, Cl. 367-6.000.
Grant, Willie T. Four-terminal zone thermostat. 4,515,306, Cl. 236-9.00A.
Grasmick, Alain D.: *See*—
Elmaleh, Samuel; and Grasmick, Alain D., 4,515,697, Cl. 210-768.000.
Gray, Billy C., to United States of America, Army. Carburetor adjustment tool. 4,515,043, Cl. 81-57.220.
Green, Gary J.: *See*—
Walsh, Dennis E.; and Green, Gary J., 4,515,092, Cl. 110-347.000.
Green, Laddie L., to Stauffer Chemical Company. Dichloro ethyl benzyl acetamide herbicide antidote. 4,515,627, Cl. 71-95.000.
Green, Paul M.: *See*—
Morrill, David R.; Mason, Mark T.; and Green, Paul M., 4,516,023, Cl. 250-235.000.
Greenberg, William H. Chassis and suspension system for vehicles. 4,515,390, Cl. 280-675.000.
Greiff, Paul: *See*—
Dew, Brock S.; and Greiff, Paul, 4,516,263, Cl. 382-41.000.
Greig, Robert E. Apparatus for coating a tire tread. 4,515,103, Cl. 118-218.000.
Greskovich, Eugene J., to Air Products and Chemicals, Inc. Combustion of coal/water slurries. 4,515,095, Cl. 110-347.000.
Griemla, Horst: *See*—
Euscher-Klingenhagen, Werner; Griemla, Horst; and Rodekamp, Hartmut, 4,515,285, Cl. 220-288.000.
Grierson, Robert A. Attachment for sail vehicles to automatically compensate for varying wind pressure. 4,515,100, Cl. 114-97.000.
Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Muhlhofer, Ernst; and Schwab, Michael, to Wacker-Chemitronic Gesellschaft Fur Elektronik-Grundstoffe mbH. Process for processing waste gases resulting during the production of silicon. 4,515,762, Cl. 423-337.000.
Grieves, John: *See*—
Bobjer, Olle; Dahlin, Torsten; and Grieves, John, 4,515,070, Cl. 98-42.070.
Grimes, Gary J., to AT&T Information Systems. Frequency and phase comparator with slip detection capability. 4,516,250, Cl. 375-82.000.
Grissom, David: *See*—
Weido, Vincent C.; and Grissom, David, 4,515,010, Cl. 73-151.000.
Groethe, Roland E. Method of manufacturing shear blades for shearing hot glass. 4,515,002, Cl. 72-339.000.
Grois, Igor: *See*—
Margolin, Mark; Grois, Igor; Herdeg, Peter K.; and Nijman, John P., 4,515,434, Cl. 350-96.210.
Grosch, Peter T. Storage container with movable identification tabs. 4,515,420, Cl. 312-12.000.
Groves, George D., to B. & G. Consultants, Inc. Integral vegetation barrier. 4,515,349, Cl. 256-1.000.
Grunbeck Wasserauebereitung GmbH: *See*—
Arens, Hans, 4,515,537, Cl. 417-489.000.
GTE Automatic Electric Inc.: *See*—
Perry, Thomas J.; and Khera, Muhammad I., 4,516,237, Cl. 370-58.000.
Perry, Thomas J., 4,516,245, Cl. 375-17.000.
GTE Laboratories Incorporated: *See*—
Lee, Ching W., 4,516,094, Cl. 333-194.000.
Lee, Ching W., 4,516,095, Cl. 333-194.000.
Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,516,057, Cl. 315-260.000.
GTE Products Corporation: *See*—
Dodds, Robert E.; and Harrigan, David J., 4,515,827, Cl. 427-68.000.
Hall, Harold H., Jr.; and Bouchard, Andre C., 4,515,558, Cl. 431-359.000.
Guffey, David M.: *See*—
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Guichard, Serge: *See*—
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Gulf & Western Manufacturing Company: *See*—
Dotson, Jarvis L., 4,515,036, Cl. 74-535.000.
Gumma, Alexandre: *See*—
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.000.
Gunnarsson, Arne N., to FMC Corporation. Steering control mechanism. 4,515,381, Cl. 280-96.000.
Gunthner, Frantz, to JENAer Glaswerk, Schott & Gen. Sheet rolling machine. 4,515,621, Cl. 65-171.000.
Gupta, Chakra V., to CommScope Company. Cable with corrosion inhibiting adhesive. 4,515,992, Cl. 174-102.00R.
Gurley, Thomas M., to RCA Corporation. Worldwide compatible synchronizing signal for accurate time base correction in an analog component interface standard. 4,516,150, Cl. 358-13.000.
Gurries, Raymond A., to Resonant Technology Company. Counterweight support for resonantly driven tool. 4,515,408, Cl. 299-37.000.
Guth, Christian; and Schafer, Paul, to Ciba Geigy Corporation. Magnesium complexes of oligomeric phosphonic acid esters, a process for their preparation and their use as stabilizers in alkaline, peroxide-containing bleach liquors. 4,515,597, Cl. 8-107.000.
Guzik, Nahum; and Mangeym, Gennady. Digital motor speed control. 4,516,060, Cl. 318-341.000.
H. J. Langen & Sons Limited: *See*—
Langen, Marinus J. M., 4,514,957, Cl. 53-252.000.
Langen, Marinus J. M., 4,514,964, Cl. 53-540.000.
H. King & Associates, Ltd.: *See*—
King, Homer F., 4,515,279, Cl. 211-153.000.
Ha, Jung Y., to KIA Industrial Co., Inc. Clutch-operated hill holder brake system. 4,515,259, Cl. 192-3.00H.
Haas, Daniel R.: *See*—
Mouser, Curtis A.; Roberts, Mark G.; Haas, Daniel R.; and Lancaster, Patrick R., III, 4,514,955, Cl. 53-64.000.
Habich, Dieter: *See*—
Metzger, Karl G.; Schrock, Wilfried; Habich, Dieter; Naab, Paul; and Zeiler, Hans-Joachim, 4,515,789, Cl. 514-196.000.

Hachino, Hiroaki: *See*—
Wakui, Yoko; Hachino, Hiroaki; Sawahata, Mamoru; Soga, Tasao; Yasuda, Tomio; and Ooue, Michio, 4,516,149, Cl. 357-71.000.

Hack, Joachim: *See*—
Gehrung, Manfred; Schoettle, Klaus; Kreissler, Helmut; Rudolf, Peter; Hack, Joachim; and Anslinger, Friedrich, 4,514,937, Cl. 51-281.05F.

Hackenberg, William: *See*—
Schwab, Carl E.; Rost, David P.; Hackenberg, William; and Holcombe, Paul, 4,516,125, Cl. 343-7.700.

Haddad, Hussain A.: *See*—
Munson, Robert E.; and Haddad, Hussain A., 4,516,097, Cl. 333-261.000.

Hadziomerovic, Faruk, to Northern Telecom Limited. Full-duplex transmission of bit streams serially and in bit-synchronism on a bus between two terminals. 4,516,236, Cl. 370-24.000.

Haenni, Eduard; Frei, Theo; and Hug, Peter, to Hammerle AG Maschinenfabrik. Apparatus for feeding sheet metal plates to a sheet shear arrangement. 4,515,050, Cl. 83-71.000.

Haferl, Peter E., to RCA Corporation. Linearity corrected horizontal deflection circuit. 4,516,058, Cl. 315-370.000.

Hagemeister, Klaus, to MTU Motoren-und Turbinen-Union Munchen GmbH. Connection of the tubular ends of a heat exchanger matrix to the associated bottom of the heat exchanger. 4,515,305, Cl. 228-173.200.

Hager, Artur: *See*—
Hertell, Siegfried; and Hager, Artur, 4,515,512, Cl. 418-1.000.

Hagita, Noriyuki: *See*—
Motomura, Kenichi; Ogawa, Hiroshi; Yamamoto, Akira; and Hagita, Noriyuki, 4,515,197, Cl. 152-209.00R.

Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Nishioka, Yoshiki, to Sharp Kabushiki Kaisha. Recognition of speech or speech-like sounds. 4,516,215, Cl. 364-513.500.

Haley, William J.; and Neumann, Guenter J., to Borg-Warner Corporation. Hydraulic control system for a clutch and transmission. 4,515,255, Cl. 192-3.570.

Hall, Douglas J.; Langley, Robert F.; and Thomas, Edwin L., to International Business Machines Corporation. Printed circuit board modification process. 4,515,878, Cl. 430-5.000.

Hall, Harold H., Jr.; and Bouchard, Andre C., to GTE Products Corporation. Encapsulated photoflash device having a radiant energy-activated disconnect switch as part of the circuitry thereof. 4,515,558, Cl. 431-359.000.

Halliburton Company: *See*—
Beck, Harold K., 4,515,219, Cl. 166-374.000.
Childs, Jerry; Sabins, Fred; and Taylor, Mary J., 4,515,216, Cl. 166-293.000.
Rao, S. Prabhakara; and Burkhalter, John F., 4,515,635, Cl. 106-90.000.

Hallmark Cards, Inc.: *See*—
Schneider, Marshall, 4,515,338, Cl. 248-460.000.

Hamano, Junichi. Slot machine with pattern confirmation and correction means. 4,515,366, Cl. 273-143.00R.

Hamilton Sorter Company, Inc.: *See*—
Kwiecinski, Alfred; and Yauger, Jon A., 4,515,086, Cl. 108-96.000.

Hamilton, Stephen P., to Texas Instruments Incorporated. Memory system with single command selective sequential accessing of predetermined pluralities of data locations. 4,516,218, Cl. 364-900.000.

Hamlin, Thomas J., to Xerox Corporation. Paddle retard feeder. 4,515,357, Cl. 271-120.000.

Hammerle AG Maschinenfabrik: *See*—
Haenni, Eduard; Frei, Theo; and Hug, Peter, 4,515,050, Cl. 83-71.000.

Hamner, James R., to Budd Co., The. In-mold coating part ejection system. 4,515,543, Cl. 425-112.000.

Hampel, Herbert J.; and Willers, Arthur G., to Northern Telecom Limited. Electronic instrument with stand doubling as console cover. 4,515,419, Cl. 312-7.100.

Hamprecht, Gerhard: *See*—
Husslein, Gerd; Ammermann, Eberhard; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,515,623, Cl. 71-12.000.
Husslein, Gerd; Hamprecht, Gerhard; Koenig, Karl-Heinz; Boehm, Walter; and Gaeng, Manfred, 4,515,985, Cl. 562-472.000.

Hamrick, Glen F.: *See*—
Walker, Paul; Hamrick, Glen F.; and Sosebee, B. Lamar, 4,515,646, Cl. 156-78.000.

Hanifin, John W., Jr.: *See*—
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,515,791, Cl. 514-248.000.

Hanna, Marie R.: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,515,987, Cl. 568-433.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,515,712, Cl. 252-522.00R.

Hannmann, Ralph A., Jr.; and Higginbotham, James F., to United States of America, Navy. Automatic centering servo actuator. 4,515,065, Cl. 91-363.00A.

Hansen, Glen D.: *See*—
Buschbom, Floyd E.; and Hansen, Glen D., 4,514,978, Cl. 60-426.000.

Hanson, Clarence A., to Hanson, Richard A. Leader holder with elastic element. 4,514,928, Cl. 43-57.200.

Hanson, Richard A.: *See*—
Hanson, Clarence A., 4,514,928, Cl. 43-57.200.

Haq, Zia, to Lever Brothers Company. Article carrying active material. 4,515,703, Cl. 252-92.000.

Hara, Masahiro; Okamoto, Atsutoshi; and Sakai, Toshiyasu, to Nippondenso Co., Ltd. High-sensitive optical reading apparatus and method of reading optical information. 4,516,017, Cl. 235-472.000.

Harase, Jirou: *See*—
Sawatani, Tadashi; Ishii, Mitsuo; Yoshimura, Hirofumi; and Harase, Jirou, 4,515,644, Cl. 148-12.0EA.

Harco Corporation: *See*—
Dimond, James R.; and Bushman, James B., 4,515,669, Cl. 204-196.000.

Harden, Charles T.: *See*—
Creek, Ronald B.; Harden, Charles T.; and Harris, Harold H., 4,515,747, Cl. 376-249.000.

Hardesty, Leonard W., Jr.: *See*—
Fenneman, David B.; Rinehart, Larry F.; and Hardesty, Leonard W., Jr., 4,516,077, Cl. 324-425.000.

Harding, Geoffrey; and Klotz, Erhard, to U.S. Philips Corporation. Device for reducing faults in layer images of a three-dimensional object formed by means of penetrating radiation. 4,516,261, Cl. 382-6.000.

Hardy, Patrick; Cantagrel, Michel; and Guichard, Serge, to LCC.CICE-Compagnie Europeenne de Composants Electroniques. Multi-layer power capacitor. 4,516,186, Cl. 361-306.000.

Harper, William P., to Rogers Corporation. Full travel keyboard. 4,515,999, Cl. 200-5.00A.

Harrigan, David J.: *See*—
Dodds, Robert E.; and Harrigan, David J., 4,515,827, Cl. 427-68.000.

Harris Corporation: *See*—
Gimpelson, George E.; and Russo, Cheryl L., 4,515,652, Cl. 156-643.000.

Harris, Eugene G.; and Fayter, Richard G., Jr., to National Distillers and Chemical Corporation. Dihydrofurans. 4,515,978, Cl. 549-484.000.

Harris, Harold H.: *See*—
Creek, Ronald B.; Harden, Charles T.; and Harris, Harold H., 4,515,747, Cl. 376-249.000.

Harris, William H. Stemmed femoral component for the human hip. 4,514,865, Cl. 3-1.913.

Harstad, Larry V. Quick change ratchet wrench. 4,515,044, Cl. 81-61.000.

Hartemann, Pierre; Meunier, Paul-Louis; and Jacobelli, Alain, to Thomson-CSF. Elastic surface wave accelerometers. 4,515,016, Cl. 73-517.00R.

Hartlaub, Jerome T.: *See*—
McDonald, Ray S.; Thompson, David L.; Rossing, Martin A.; and Hartlaub, Jerome T., 4,515,159, Cl. 128-419.0PG.

Hartung, Herbert: *See*—
Billenstein, Siegfried; Hartung, Herbert; May, Adolf; and Bucking, Hans-Walter, 4,515,723, Cl. 260-404.500.

Haruta, Toshio: *See*—
Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, 4,515,691, Cl. 210-274.000.

Harvey, Donald M., to Eastman Kodak Company. Exposure control mechanism. 4,515,457, Cl. 354-443.000.

Hasegawa, Shumpei; and Otobe, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Method for detecting opening of a throttle valve in a fully closed position in an internal combustion engine. 4,515,009, Cl. 73-118.000.

Hasegawa, Shumpei, to Honda Motor Co., Ltd. Method for controlling fuel supply to an internal combustion engine at deceleration. 4,515,130, Cl. 123-493.000.

Hasegawa, Yoshio: *See*—
Yajima, Seishi, deceased; Noda, Akiko, heir; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamaura, Takemi, 4,515,742, Cl. 264-63.000.

Hashimoto, Tadashi, to Mitsubishi Plastics Industries Limited. Magazine for electronic devices. 4,515,269, Cl. 206-334.000.

Hashimoto, Yasuo: *See*—
Ishino, Ken; Hashimoto, Yasuo; Ichihara, Kenichi; and Narumiya, Yoshikazu, 4,515,850, Cl. 428-225.000.

Haslanger, Martin F.: *See*—
Das, Jagabandhu; and Haslanger, Martin F., 4,515,972, Cl. 549-229.000.

Haslegrave, John A.; and Sullivan, Daniel S., to Exxon Research & Engineering Co. Corrosion inhibitors. 4,515,708, Cl. 252-390.000.

Hassall, Cedric H.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,515,969, Cl. 549-39.000.

Hatakeyama, Sakichi: *See*—
Ogano, Takeo; Sueshige, Hiroshi; and Hatakeyama, Sakichi, 4,514,917, Cl. 37-249.000.

Hattori, Yoshiyuki: *See*—
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.

Haubner, Georg; and Schmid, Hans-Dieter. Magneto ignition system, particularly for one-cylinder internal combustion engines. 4,515,118, Cl. 123-149.00C.

Hauser, Frank M.; and Mal, Dipakranjan, to Oregon Graduate Center for Study & Research. Method of synthesizing a late-stage intermediate to 11-deoxydaunorubicin and 11-deoxyadriamycin, and two precursors to the object intermediate. 4,515,720, Cl. 260-351.100.

Hawkinson, Raymond P., Jr.; and Newman, Dennis W., to Paul E. Hawkinson Company. Tire defect tester. 4,516,068, Cl. 324-54.000.

Hayakawa, Hideyuki: *See*—
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.

Hayase, Isao; Mizukami, Masao; and Kishi, Atsuo, to Hitachi, Ltd. Rotary compressor with inner and outer cylinders and axial insert type discharge valves. 4,515,513, Cl. 418-101.000.

Hayase, Isao; Suginuma, Atsushi; Kishi, Atsuo; and Kawashima, Kenichi, to Hitachi, Ltd. Vane-type rotary machine. 4,515,514, Cl. 418-150.000.

Hayashi, Kiyoshi: *See*—
Kawahara, Yoshihiro; and Hayashi, Kiyoshi, 4,516,141, Cl. 346-153.100.

Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Valve operating system of internal combustion engine. 4,515,116, Cl. 123-90.430.

Hayashi, Yoshimasa; and Ogawa, Naoki, to Nissan Motor Company, Limited. Bearing beam structure of automotive engine. 4,515,119, Cl. 123-198.00E.

Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Engine control system. 4,515,124, Cl. 123-324.000.

Hayashi, Yoshimi: *See*—
Keino, Goro; Kitagawa, Yosuke; and Hayashi, Yoshimi, 4,515,849, Cl. 428-201.000.

Hayfield, Peter C. S., to Marston Palmer Limited. Electrode with anode active layer. 4,515,673, Cl. 204-290.00F.

Haymore, Ralph B.; and Winter, Heinz W., to Envirotech Corporation. Cable lifting mechanism for sedimentation device. 4,515,694, Cl. 210-531.000.

Hazeltine Corporation: *See*—
Masak, Raymond J.; and Kowalski, Anthony M., 4,516,126, Cl. 343-383.000.

Hazenbroek, Jacobus E. Suspended feather picker with rotatable sections. 4,514,879, Cl. 17-11.10R.

Health Care Concepts, Inc.: *See*—
Amendolia, Pasquale J., 4,515,588, Cl. 604-118.000.

Heathcoat, Michael J.; Jackson, Douglas H.; Jowitt, Frederick W.; Madley, Jack R.; and Stuart, Ian C. E., to Metal Box Limited. Apparatus for electrocoating. 4,515,677, Cl. 204-300.0EC.

Heerlein, Manfred, to Siemens Aktiengesellschaft. Axial fan with blades that automatically adjust to the direction of rotation. 4,515,511, Cl. 416-131.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Vinyl ester resins containing triazine or both triazine and oxazoline groups. 4,515,934, Cl. 528-92.000.

Heiber, Oskar: *See*—
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.00C.

Height Inc.: *See*—
Shinriki, Tatsuo, 4,515,819, Cl. 426-297.000.

Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, to Kali-Chemie Pharma GmbH. 1,5-Diphenyl-2-haloalkylpyrazolin-3-one intermediates. 4,515,944, Cl. 544-91.000.

Heisler, Carl B., to Xerox Corporation. Sheet delivery station for copying apparatus. 4,515,466, Cl. 355-15.000.

Heliotronic Forschungs-und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe m.b.H.: *See*—
Dietl, Josef; and Kotilge, Jorg, 4,515,600, Cl. 23-293.00R.

Hellmann, Walter: *See*—
Kolbe, Klaus; Hellmann, Walter; Krajec, Otmar; Schikowsky, Hartmut; and Vetter, Heinz, 4,515,648, Cl. 156-196.000.

Hemmerich, Karl J.; Millerd, Donald L.; and Semedo, Anthony B., to IVAC Corporation. Disposable syringe cartridge for fluid delivery apparatus. 4,515,591, Cl. 604-152.000.

Hengesbach, Robert W. Spraying apparatus and method. 4,515,310, Cl. 239-8.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Knaster, Mark, 4,515,643, Cl. 148-6.15Z.
Ritter, Wolfgang, 4,515,724, Cl. 260-410.000.

Hennart, Claude; and Blanc, Rene , to Airwick Industries, Inc. Insecticidal vapors-emitting composition on a pyrethrinoid base. 4,515,768, Cl. 424-40.000.

Hennig, Eberhard; Klie, Juergen; and Wellendorf, Klaus, to Dr. Ing. Rudolf Hell GmbH. Method for partially smoothing retouch in electronic color reproduction. 4,516,155, Cl. 358-80.000.

Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, to Hoechst Aktiengesellschafat. Substituted derivatives of octahydroindole-2-carboxylic acids. 4,515,803, Cl. 514-338.000.

Henschel, Claude: *See*—
Bose, Debasis; Datta, Amitava; DeChristofaro, Nicholas J.; and Henschel, Claude, 4,515,868, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,869, Cl. 428-656.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,515,870, Cl. 428-656.000.

Hercules Incorporated: *See*—
Maslanka, William W., 4,515,657, Cl. 162-164.300.

Herdeg, Peter K.: *See*—
Margolin, Mark; Grois, Igor; Herdeg, Peter K.; and Nijman, John P., 4,515,434, Cl. 350-96.210.

Hergeth, Helmut: *See*—
Hergeth, Hubert; and Hergeth, Helmut, 4,514,881, Cl. 19-80.00R.

Hergeth Hollingsworth, GmbH: *See*—
Hergeth, Hubert; and Hergeth, Helmut, 4,514,881, Cl. 19-80.00R.

Hergeth, Hubert; and Hergeth, Helmut, to Hergeth Hollingsworth, GmbH. Method and apparatus for reducing fiber bales. 4,514,881, Cl. 19-80.00R.

Herlihy, Walter C., to Repligen Corporation. Skin tanning composition and method. 4,515,773, Cl. 424-59.000.

Herman Miller, Inc.: *See*—
Kurrasch, Andrew J., 4,515,087, Cl. 108-147.000.

Herman, Raymond L., to United States of America, Energy. Method of and apparatus for testing the integrity of filters. 4,515,007, Cl. 73-38.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Anders, Dietmar, 4,515,738, Cl. 264-40.700.

Hermann Wangner GmbH & Co. KG: *See*—
Borel, Georg, 4,515,853, Cl. 428-257.000.

Hermes, Chester E.; and Huang, Wann-Sheng, to Texaco Inc. Steam injection method with constant rate of heat. 4,515,215, Cl. 166-272.000.

Hernqvist, Karl G., to RCA Corporation. Method of electrically processing a CRT mount assembly to reduce arcing and afterglow. 4,515,569, Cl. 445-5.000.

Herold, Robert A.: *See*—
Dizek, Frederick A.; Vogel, Eric S.; Tiedeman, C. John, Jr.; and Herold, Robert A., 4,515,629, Cl. 75-0.50B.

Herr, R. Wilbur: *See*—
Strom, Alice M.; Herr, R. Wilbur; and Martin, Sylvia, 4,515,663, Cl. 204-44.200.

Herren, Thomas W., Jr. Moveable target assembly. 4,515,374, Cl. 273-359.000.

Hertell, Siegfried; and Hager, Artur, to Barmag Barmer Maschinenfabrik AG. Seal for high pressure pump or the like. 4,515,512, Cl. 418-1.000.

Hestair Kiddicraft Limited: *See*—
Emms, Norman R., 4,515,572, Cl. 446-153.000.

Hester, Robert W. Decoying calculator. 4,516,013, Cl. 235-78.00R.

Hettinger, William P., Jr.; Turrill, Frank H.; Rozman, George J.; and Beck, H. Wayne, to Ashland Oil, Inc. Naphthenic lube oils. 4,515,680, Cl. 208-87.000.

Hettinger, William P., Jr.; and Beck, Hubert W., to Ashland Oil, Inc. Sorbent useful in a visbreaking treatment of carbo-metallic oils. 4,515,900, Cl. 502-63.000.

Heward, Peter D.; Jones, Valerie A.; and Jones, John C., to Crowcroft Engineering Limited. Skip trailer. 4,515,510, Cl. 414-422.000.

Hewitt, Alan R.: *See*—
Robilliard, Leonard T.; and Hewitt, Alan R., 4,515,494, Cl. 403-187.000.

Heyl, Walter, to Linde Aktiengesellschaft. Adjustable axial piston machines. 4,515,067, Cl. 91-506.000.

Hicks, James E., to RCA Corporation. Shutdown circuit for a switching regulator in a remote controlled television receiver. 4,516,168, Cl. 358-190.000.

Hidaka, Kunihiko; Fukushima, Naoto; and Iwata, Kazuro, to Nissan Motor Company, Limited. Piston stroke responsive vortex-flow shock absorber. 4,515,252, Cl. 188-282.000.

Higginbotham, James F.: *See*—
Hannmann, Ralph A., Jr.; and Higginbotham, James F., 4,515,065, Cl. 91-363.00A.

Higuchi, Mamoru: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.

Hihara, Toshio: *See*—
Niwa, Toshio; and Hihara, Toshio, 4,515,716, Cl. 534-635.000.

Hijikigawa, Masaya: *See*—
Furubayashi, Hisatoshi; Tanaka, Junichi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,515,653, Cl. 156-643.000.

Hill, Christine R.: *See*—
Hill, Henry R.; and Hill, Christine R., 4,515,293, Cl. 222-95.000.

Hill, Daryl G. Belt conveyer system and conveyer belt usable therewith. 4,515,265, Cl. 198-821.000.

Hill, Henry R.; and Hill, Christine R. Dispenser for collapsible containers with hydraulic actuation. 4,515,293, Cl. 222-95.000.

Hilton-Davis Chemical Co.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,515,971, Cl. 549-225.000.

Hinrichs, Richard J.; and Thuen, Judy, to Applied Polymer Technology, Inc. Control system for processing composite material. 4,515,545, Cl. 425-143.000.

Hinze, Heinz-Joachim; Soder, Alfons; and Popendiker, Kurt, to Hoechst Aktiengesellschaft. Pharmaceutical compositions. 4,515,795, Cl. 514-263.000.

Hiraga, Ryozo: *See*—
Yamada, Yasuyoshi; and Hiraga, Ryozo, 4,515,481, Cl. 356-400.000.

Hirano, Kazuo: *See*—
Moriyama, Masakazu; Shinohara, Toshio; Hirano, Kazuo; and Makino, Fumio, 4,516,121, Cl. 340-825.050.

Hirano, Takao: *See*—
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,515,941, Cl. 536-7.100.

Hirata, Yasushi: *See*—
Sakakibara, Mitsuhiko; Yoshizawa, Masao; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,515,922, Cl. 525-99.000.

Hirshfeld, Uri, to Orda Industries Ltd. Hand-held ball game. 4,515,373, Cl. 273-317.000.

Hisajima, Masahiko: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikawa, Yasuhiko; and Nagashima, Takashi, 4,515,464, Cl. 355-14.00R.
Hisatsune, Fumiyuki: *See*—
Murata, Shirou; Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,002, Cl. 200-144.00C.
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,003, Cl. 200-144.00C.
Hishinuma, Yukio: *See*—
Azuhata, Shigeru; Arashi, Norio; Narato, Kiyoshi; Inada, Tooru; Souma, Kenichi; Ohtsuka, Keizou; Hishinuma, Yukio; and Masai, Tadahisa, 4,515,094, Cl. 110-347.000.
Hitachi Keiyo Eng. Co., Ltd.: *See*—
Ninomiya, Hisakazu; Ibori, Satoshi; Nagase, Hiroshi; Igarashi, Sadayuki; and Sugai, Hiroshi, 4,516,065, Cl. 318-811.000.
Hitachi, Ltd.: *See*—
Azuhata, Shigeru; Arashi, Norio; Narato, Kiyoshi; Inada, Tooru; Souma, Kenichi; Ohtsuka, Keizou; Hishinuma, Yukio; and Masai, Tadahisa, 4,515,094, Cl. 110-347.000.
Hayase, Isao; Mizukami, Masao; and Kishi, Atsuo, 4,515,513, Cl. 418-101.000.
Hayase, Isao; Suginuma, Atsushi; Kishi, Atsuo; and Kawashima, Kenichi, 4,515,514, Cl. 418-150.000.
Ito, Tosikazu; Komathuzaki, Kiyomi; Chonan, Kenichi; and Horibe, Kiyoshi, 4,515,066, Cl. 91-454.000.
Kadowaki, Yoshihiko, 4,516,202, Cl. 364-200.000.
Kajiyama, Sigeru, 4,515,018, Cl. 73-637.000.
Kawagoe, Hiroto, 4,514,894, Cl. 29-571.000.
Komeyama, Yoshihiro; and Taniguchi, Motoya, 4,516,254, Cl. 378-34.000.
Matsushita, Nobuo; Furukawa, Tokinobu; Shintani, Tetsuo; Sumitani, Tomoaki; and Oda, Chikao, 4,515,008, Cl. 73-53.000.
Matsuzaki, Isokazu; Yamagiwa, Akira; Watanabe, Yutaka; Matsumoto, Takashi; and Yabe, Katsumi, 4,516,039, Cl. 307-455.000.
Nakata, Yukio; Terada, Matsuaki; Suda, Kaoru; Morito, Motoyoshi; and Shiotsu, Osamu, 4,516,221, Cl. 364-900.000.
Ninomiya, Hisakazu; Ibori, Satoshi; Nagase, Hiroshi; Igarashi, Sadayuki; and Sugai, Hiroshi, 4,516,065, Cl. 318-811.000.
Nishizawa, Shigeki; Nagahara, Shusaku; and Ozawa, Naoki, 4,516,154, Cl. 358-44.000.
Wakui, Yoko; Hachino, Hiroaki; Sawahata, Mamoru; Soga, Tasao; Yasuda, Tomio; and Ooue, Michio, 4,516,149, Cl. 357-71.000.
Hitzman, Donald O., to Phillips Petroleum Company. Gelled acid composition. 4,515,700, Cl. 252-8.55R.
HKC, Inc.: *See*—
Boese, Harold L., 4,515,382, Cl. 280-221.000.
Hoccum Developments Limited: *See*—
Cox-Smith, Peter; Calvert, Colin; and Wesley, John, 4,515,582, Cl. 494-7.000.
Hochman, Joel S. Device for the development, training and rehabilitation of the pubococcygeal and related perineal musculature of the female. 4,515,167, Cl. 128-736.000.
Hoeberechts, Arthur M. E.: *See*—
Shannon, John M.; Hoeberechts, Arthur M. E.; and Van Gorkom, Gerardus G. P., 4,516,146, Cl. 357-52.000.
Hoechst Aktiengesellschafat: *See*—
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,515,803, Cl. 514-338.000.
Hoechst Aktiengesellschaft: *See*—
Berthold, Rudiger, 4,515,940, Cl. 534-565.000.
Billenstein, Siegfried; Hartung, Herbert; May, Adolf; and Bucking, Hans-Walter, 4,515,723, Cl. 260-404.500.
Dopfer, Peter; Ostermeier, Johann; and Schwerin, Siegfried, 4,515,639, Cl. 106-288.00Q.
Hinze, Heinz-Joachim; Soder, Alfons; and Popendiker, Kurt, 4,515,795, Cl. 514-263.000.
Maurer, Alexander; and Staendeke, Horst, 4,515,632, Cl. 106-18.160.
Meininger, Fritz; Otten, Joachim W., deceased; Otten, Ursula, heir; and Rudolph nee Otten, Anna G., heir, 4,515,598, Cl. 8-549.000.
Teetz, Volker, 4,515,960, Cl. 548-408.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,515,946, Cl. 548-237.000.
Hoffman, Daniel E.: *See*—
Reed, Michael R.; and Hoffman, Daniel E., 4,515,211, Cl. 166-77.000.
Hoffman, Lester J.: *See*—
Roberts, Richard D.; Franz, James H., Jr.; Hoffman, Lester J.; and Miller, Lalan G., 4,516,059, Cl. 318-301.000.
Hoffman, Philip A., to Solid State Chargers Research and Development Limited Partnership. Regulated power supply with current regulating circuit. 4,516,067, Cl. 323-265.000.
Hoffmann-La Roche Inc.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,515,969, Cl. 549-39.000.
Hofheinz, Werner, 4,515,790, Cl. 514-234.000.
Kompis, Ivan; Rey-Bellet, Gerald; and Zanetti, Guido, 4,515,948, Cl. 544-325.000.
Hofheinz, Werner, to Hoffmann-La Roche Inc. Antiprotozoal 2-nitroimidazole compounds. 4,515,790, Cl. 514-234.000.
Hofmann, Rolf: *See*—
Moser, Kurt; and Hofmann, Rolf, 4,515,459, Cl. 355-3.0FU.
Hogan, Martin J., to General Motors Corporation. Bearing assembly with stamped races. 4,515,418, Cl. 384-502.000.
Hohrein, Henry E. Weapon rim-fire conversion unit II. 4,515,064, Cl. 89-128.000.
Hojo, Yoshikata: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.
Holcombe, Paul: *See*—
Schwab, Carl E.; Rost, David P.; Hackenberg, William; and Holcombe, Paul, 4,516,125, Cl. 343-7.700.
Holden, Paul C.: *See*—
North, William E.; Holden, Paul C.; and Hultgren, Kent G., 4,515,523, Cl. 415-115.000.
Holden, Robert S.: *See*—
Ferber, John G.; Goddard, Peter J.; and Holden, Robert S., 4,515,990, Cl. 568-808.000.
Hollerweger, Heinz: *See*—
Blatt, Georg; van den Boom, Johannes; Kuipers, Geert; and Hollerweger, Heinz, 4,515,239, Cl. 181-290.000.
Hollinger, John D.; and Pedroso, Raul I., to Coulter Corporation. Particle analyzing and sorting apparatus. 4,515,274, Cl. 209-3.100.
Hollister, F. Harold; and Meyer, Danny S., to Joy Manufacturing Company. Gate valve with internal pressure relief means. 4,515,174, Cl. 137-72.000.
Hollmann, Bernd: *See*—
Moosbrucker, Karl; Hollmann, Bernd; and Freye, Theodor, 4,514,969, Cl. 56-341.000.
Holmes, Dale A., to Rockwell International Corporation. Common-pass decentered annular ring resonator with improved polarization control. 4,516,244, Cl. 372-99.000.
Holmes, Robert G., to Ohio Agricultural Research and Development Center, The. Seed planter, planter assembly and method of picking up and discharging single seeds. 4,515,291, Cl. 221-211.000.
Holmsten, Richard B. Refrigeration system for ice rinks utilizing pressure control/metering valve. 4,514,992, Cl. 62-235.000.
Holmwood, Graham; Lurssen, Klaus; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Benzyl-pyrimidinylalkyl-ethers as plant growth regulators and fungicides, and corresponding pyrimidinylcarbinols. 4,515,617, Cl. 71-76.000.
Holoch, Klaus: *See*—
Barzynski, Helmut; and Holoch, Klaus, 4,515,877, Cl. 430-5.000.
Holstein, Herbert: *See*—
Borner, Roland; and Holstein, Herbert, 4,514,935, Cl. 51-165.00R.
Holton, Percy G., to Syntex Corporation. Process for the resolution of d,l 2-(6-methoxy-2-naphthyl)propionic acid. 4,515,811, Cl. 514-554.000.
Holubka, Joseph W., to Ford Motor Company. Coating composition comprising bis-diene oligomers and bis-dieneophile oligomers. 4,515,926, Cl. 525-449.000.
Holzl, Robert A., to Dart Industries Inc. Self protecting carbon bodies and method for making same. 4,515,860, Cl. 428-408.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Shumpei; and Otobe, Yutaka, 4,515,009, Cl. 73-118.000.
Honma, Kenji; Asami, Toshio; Baba, Masayuki; and Nakayama, Sumio, 4,515,384, Cl. 280-276.000.
Matsuura, Masaaki; and Nakano, Yoshikatsu, 4,515,121, Cl. 123-198.00F.
Ogano, Takeo; Sueshige, Hiroshi; and Hatakeyama, Sakichi, 4,514,917, Cl. 37-249.000.
Ogishima, Tetsuo, 4,515,405, Cl. 296-78.100.
Sato, Makoto, 4,515,412, Cl. 303-6.00R.
Takeo, Tadashi; Yamamoto, Toru; and Yamashito, Sachihiro, 4,515,521, Cl. 414-735.000.
Tsuboi, Masaharu, 4,515,038, Cl. 74-606.00R.
Honda Motor Co., Ltd.: *See*—
Hasegawa, Shumpei, 4,515,130, Cl. 123-493.000.
Honeywell Inc.: *See*—
Brownell, David J.; and Roberts, Jon A., 4,515,668, Cl. 204-192.00D.
Hongou, Hiroshi: *See*—
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.
Honma, Kenji; Asami, Toshio; Baba, Masayuki; and Nakayama, Sumio, to Honda Giken Kogyo Kabushiki Kaisha; and Showa Manufacturing Co., Ltd. Front wheel suspension system for a motorcycle. 4,515,384, Cl. 280-276.000.
Hooft van Huijsduijnen, Jozef A. M., to U.S. Philips Corporation. Cathode-ray tube and cathode unit for such a cathode-ray tube. 4,516,051, Cl. 313-446.000.
Hoorn, Willem A., to Du Pont de Nemours, E. I., and Company. Automatic X-ray film cassette unloader and reloader. 4,514,958, Cl. 53-266.00R.
Hopkins, Hammond W. Escalator tread cleaning brush. 4,514,872, Cl. 15-256.500.
Horibe, Kiyoshi: *See*—
Ito, Tosikazu; Komathuzaki, Kiyomi; Chonan, Kenichi; and Horibe, Kiyoshi, 4,515,066, Cl. 91-454.000.
Horikoshi, Hiroshi; Arai, Akio; Tsukagoshi, Sadayuki; and Sakamoto, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Device for measuring swing data of baseball bat. 4,515,365, Cl. 273-25.000.
Horne, Edward A. Container rack. 4,515,334, Cl. 248-146.000.
Horsch, Martha E.: *See*—
Swider, Robert A.; and Horsch, Martha E., 4,515,911, Cl. 523-414.000.

Hosaka, Hideo: *See*—
Iwataki, Isao; Fujita, Kagari; Ishikawa, Hisao; Hosaka, Hideo; and Kohara, Kenichi, 4,515,729, Cl. 260-464.000.
Hoskin, Dennis H., to Mobil Oil Corporation. Low cost, brine tolerant sulfonate and sulfate surfactants having 1,3-dihydrocarboxy-2-propyl hydrophobic tails. 4,515,701, Cl. 252-8.55D.
Hosono, Akira: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.
Hottinger Baldwin Measurements, Inc.: *See*—
Rubinstein, Randall B., 4,515,232, Cl. 177-154.000.
Houlberg, Jorn P. Injection moulded bag closure. 4,514,876, Cl. 16-110.00R.
Houser, David E.: *See*—
Frisbie, Richard C.; Houser, David E.; Morenus, Richard J.; and Thomas, Edwin L., 4,515,505, Cl. 409-163.000.
Howard, Richard E.; Pleibel, William; Simpson, Jay R.; and Stolen, Rogers H., to AT&T Bell Laboratories. Single-mode single-polarization optical fiber. 4,515,436, Cl. 350-96.330.
Howard, Robert. Card shuffler having a random ejector. 4,515,367, Cl. 273-149.00R.
Hsu, Wen-Liang: *See*—
Shore, Sheldon G.; and Hsu, Wen-Liang, 4,515,728, Cl. 260-429.0CY.
Huang, Alan; and Knauer, Scott C., to AT&T Bell Laboratories. Self-routing switching network. 4,516,238, Cl. 370-60.000.
Huang, Wann-Sheng: *See*—
Hermes, Chester E.; and Huang, Wann-Sheng, 4,515,215, Cl. 166-272.000.
Huber, Gustave: *See*—
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.000.
Huber, Hans P.; and Weber, Jochen, to Licentia Patent-Verwaltungs-GmbH. Method of manufacturing a radiation receiver. 4,516,010, Cl. 219-121.0LJ.
Huber, Siegfried, to Bayerische Motoren Werke AG. Safety helmet, especially for users of automotive vehicles. 4,514,864, Cl. 2-424.000.
Hubner, Klaus M.: *See*—
Sgroi, Carl M.; and Hubner, Klaus M., 4,515,149, Cl. 126-442.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Stripping a solution containing molybdenum, tungsten and/or vanadium values. 4,515,757, Cl. 423-54.000.
Hudson Engineering Company: *See*—
Napolitano, Pellegrino E., 4,515,180, Cl. 137-565.000.
Hudson, Kenneth C., to RCA Corporation. Automatically adjustable aperture stop for optical scanning system. 4,516,024, Cl. 250-236.000.
Hue, Jean-Pierre, to 501 Etablissement Public dit "Centre National d'Exploitation des Oceans" (CNEXO). Apparatus for measuring the vertical acceleration due to the swell. 4,515,013, Cl. 73-170.00A.
Hug, Peter: *See*—
Haenni, Eduard; Frei, Theo; and Hug, Peter, 4,515,050, Cl. 83-71.000.
Hughes Aircraft Company: *See*—
Effinger, David D.; and Docter, Richard, 4,516,085, Cl. 331-40.000.
Hughes, David T.: *See*—
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,516,199, Cl. 364-200.000.
Hughes Tool Company - USA: *See*—
Dolezal, George E.; and Kelly, Joseph L., Jr., 4,515,228, Cl. 175-313.000.
Hultgren, Kent G.: *See*—
North, William E.; Holden, Paul C.; and Hultgren, Kent G., 4,515,523, Cl. 415-115.000.
Hultz, Robert C.: *See*—
Stamper, Richard W.; and Hultz, Robert C., 4,515,744, Cl. 264-171.000.
Humber, David C.: *See*—
Phillipps, Gordon H.; Humber, David C.; Ewan, George B.; and Coomber, Barry A., 4,515,786, Cl. 514-182.000.
Humber, Leslie G.: *See*—
Demerson, Christopher A.; and Humber, Leslie G., 4,515,961, Cl. 548-432.000.
Humphries, Rowland F.: *See*—
Grainge, Richard W.; and Humphries, Rowland F., 4,516,158, Cl. 358-109.000.
Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,515,971, Cl. 549-225.000.
Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,515,201, Cl. 160-174.000.
Hunter Douglas International N.V.: *See*—
Edixhoven, Gerardus H., 4,514,886, Cl. 29-24.500.
Hunter, James R., to Warner & Swasey Company, The. Sheet metal workholder utilizing linear wedge action. 4,515,355, Cl. 269-234.000.
Hupp, Stephen S., to Ashland Oil, Inc. Process for preparing maleimide. 4,515,965, Cl. 548-548.000.
Hurtado, Ruben G. Lathe dust enclosure. 4,514,936, Cl. 51-270.000.
Husslein, Gerd; Ammermann, Eberhard; Hamprecht, Gerhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Control of unwanted plant growth with 2-aryloxy-2-azolylalkanecarboxamides. 4,515,623, Cl. 71-12.000.
Husslein, Gerd; Hamprecht, Gerhard; Koenig, Karl-Heinz; Boehm, Walter; and Gaeng, Manfred, to BASF Aktiengesellschaft. Preparation of chlorinated phenoxyalkanoic acids. 4,515,985, Cl. 562-472.000.
Hutchison, John B., to BICC Public Limited Company. Electric cable glands. 4,515,991, Cl. 174-65.0SS.
Ibori, Satoshi: *See*—
Ninomiya, Hisakazu; Ibori, Satoshi; Nagase, Hiroshi; Igarashi, Sadayuki; and Sugai, Hiroshi, 4,516,065, Cl. 318-811.000.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Refrigerated display case having ambient air defrost. 4,514,988, Cl. 62-82.000.
Ichihara, Kenichi: *See*—
Ishino, Ken; Hashimoto, Yasuo; Ichihara, Kenichi; and Narumiya, Yoshikazu, 4,515,850, Cl. 428-225.000.
Ichijo, Chikara: *See*—
Fukayama, Miyoji; and Ichijo, Chikara, 4,515,834, Cl. 427-387.000.
Ichoh, Tasuku: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, to Unitika, Ltd. Filtration apparatus. 4,515,691, Cl. 210-274.000.
Ide, Russell D. Elastomeric supported hydrodynamic bearing. 4,515,486, Cl. 384-117.000.
Ideal Security Hardware Corporation: *See*—
Arneberg, Walter, 4,514,878, Cl. 16-300.000.
Idttkow, Inc.: *See*—
Johnson, Randolph K., 4,514,993, Cl. 62-372.000.
Igarashi, Sadayuki: *See*—
Ninomiya, Hisakazu; Ibori, Satoshi; Nagase, Hiroshi; Igarashi, Sadayuki; and Sugai, Hiroshi, 4,516,065, Cl. 318-811.000.
Iimura, Takashi: *See*—
Yanagihara, Masaki; and Iimura, Takashi, 4,516,078, Cl. 328-167.000.
Ikeda, Hisatoshi: *See*—
Kobayashi, Akio; Mizoguchi, Hitoshi; Ikeda, Hisatoshi; and Mayama, Hidekiyo, 4,516,006, Cl. 200-148.00A.
Ikeda, Tsutomu: *See*—
Kizu, Shuji; Ikeda, Tsutomu; and Iwamoto, Masanori, 4,516,265, Cl. 382-48.000.
Imai, Jiro: *See*—
Torrence, Paul F.; Johnston, Margaret I.; and Imai, Jiro, 4,515,781, Cl. 514-46.000.
Imai, Motomasa; Takahashi, Takashi; Furukawa, Osamu; and Kanai, Hideyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Metal oxide varistor with non-diffusable electrodes. 4,516,105, Cl. 338-21.000.
Imakoshi, Shigeyoshi; Soda, Yutaka; Uchida, Hiroyuki; Sugita, Junkichi; Takino, Hiroshi; Sekiya, Tetsuo; and Suyama, Hideo, to Sony Corporation. Magnetic transducer head utilizing magnetoresistance effect. 4,516,179, Cl. 360-113.000.
Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co.): *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 4,515,557, Cl. 431-302.000.
Imanishi, Yasuhiro: *See*—
Matsuo, Shuitsu; Imanishi, Yasuhiro; Nagashima, Hideo; Watanabe, Masaharu; Usami, Toshiro; and Muraoka, Hisashi, 4,515,755, Cl. 422-246.000.
Impact Systems, Inc.: *See*—
Stephansen, Erik W., 4,514,913, Cl. 34-48.000.
Imperial Chemical Industries PLC: *See*—
Kay, Ian T.; and Noon, Robert A., 4,515,959, Cl. 548-378.000.
Imura, Shinichi: *See*—
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.
Inada, Tooru: *See*—
Azuhata, Shigeru; Arashi, Norio; Narato, Kiyoshi; Inada, Tooru; Souma, Kenichi; Ohtsuka, Keizou; Hishinuma, Yukio; and Masai, Tadahisa, 4,515,094, Cl. 110-347.000.
Inden, Masahiro; and Kuwana, Kazutaka, to Aisin Seiki Kabushiki Kaisha. Solenoid valve. 4,515,345, Cl. 251-141.000.
Indian Industries, Inc.: *See*—
Nurney, David J., 4,515,142, Cl. 124-23.00R.
Ingersoll-Rand Company: *See*—
Luthi, Oscar, 4,515,693, Cl. 210-402.000.
Ingmar, Bjelkhagen H. Device for the ocular determination of any discrepancy in the luminescence capacity of the surface of a tooth for the purpose of identifying any caried area on the surface to the tooth. 4,515,476, Cl. 356-318.000.
Ingram, Gary L., to Spencer Wright Industries, Inc. Tufting machines. 4,515,096, Cl. 112-79.00R.
Inke, S.A.: *See*—
Caldero Ges, Jose M.; and Faba, Eusebio M., 4,515,806, Cl. 514-471.000.
Ino, Takashi: *See*—
Shioiri, Tomonori; and Ino, Takashi, 4,515,902, Cl. 502-64.000.
Inoue, Hiroshi: *See*—
Komatsu, Shigeru; and Inoue, Hiroshi, 4,516,147, Cl. 357-59.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,516,009, Cl. 219-69.00P.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Capacitor-type HF power supply for electrical machining. 4,516,009, Cl. 219-69.00P.
Inoue, Takehisa; and Miwa, Kishio, to Toray Industries, Incorporated. Separation process for a gas mixture. 4,515,605, Cl. 55-26.000.

Intech Corporation: *See—*
Sewell, James H.; Gaede, Hans; and Ritch, Curtis R., 4,515,299, Cl. 223-76.000.
Intech Systems Corp.: *See—*
Slavin, Martin J., 4,515,164, Cl. 128-663.000.
International Business Machines Corporation: *See—*
Boehm, Russell W.; Rippstein, Robert P.; and Stone, David R., 4,515,544, Cl. 425-129.00R.
Carsalade, Henri; Delaporte, Francois-Xavier; and Pantani, Jean-Pierre, 4,516,247, Cl. 375-56.000.
Chaudhari, Praveen; and Muller, Rene , 4,515,650, Cl. 156-622.000.
Christopher, Robert J.; and Walker, Robert F., 4,516,266, Cl. 382-48.000.
Cunningham, Earl A.; and Palmer, Dean C., 4,516,165, Cl. 360-53.000.
Economy, James; and Flandera, Mary A., 4,515,828, Cl. 427-82.000.
Frisbie, Richard C.; Houser, David E.; Morenus, Richard J.; and Thomas, Edwin L., 4,515,505, Cl. 409-163.000.
Hall, Douglas J.; Langley, Robert F.; and Thomas, Edwin L., 4,515,878, Cl. 430-5.000.
International Ferrox Co., Establishment: *See—*
Vallak, Enn; and Vallak, Hannes, 4,515,341, Cl. 249-106.000.
International Flavors & Fragrances Inc.: *See—*
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,515,987, Cl. 568-433.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,966, Cl. 549-30.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,967, Cl. 549-39.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,968, Cl. 549-39.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,515,712, Cl. 252-522.00R.
International Paper Company: *See—*
Lovelace, Harold, 4,515,580, Cl. 493-183.000.
Internationale Octrooi Maatschappij "Octropa": *See—*
Armstead, Brian H.; and Quinn, James P., 4,515,821, Cl. 426-330.400.
Irie, Yoichiro: *See—*
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikawa, Yasuhiko; and Nagashima, Takashi, 4,515,464, Cl. 355-14.00R.
Isenberg, Gerry E.; Forshey, Terry L.; and Keller, Robert D., Jr., to Sperry Corporation. Tundish cover for ductile iron treatment. 4,515,353, Cl. 266-236.000.
Ishida, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Address designating method of memory and apparatus therefor. 4,516,219, Cl. 364-900.000.
Ishida, Takehisa, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus with serial weighing operations. 4,515,231, Cl. 177-25.000.
Ishida, Yoshiaki: *See—*
Karino, Saburo; and Ishida, Yoshiaki, 4,515,737, Cl. 264-22.000.
Ishii, Mitsuo: *See—*
Sawatani, Tadashi; Ishii, Mitsuo; Yoshimura, Hirofumi; and Harase, Jirou, 4,515,644, Cl. 148-12.0EA.
Ishii, Tsutomu: *See—*
Takahara, Takeshi; Ishii, Tsutomu; and Shirakawa, Yasuhiro, 4,515,706, Cl. 252-301.40H.
Ishikawa, Hisao: *See—*
Iwataki, Isao; Fujita, Kagari; Ishikawa, Hisao; Hosaka, Hideo; and Kohara, Kenichi, 4,515,729, Cl. 260-464.000.
Ishino, Ken; Hashimoto, Yasuo; Ichihara, Kenichi; and Narumiya, Yoshikazu, to TDK Corporation. Composite ferrite textile. 4,515,850, Cl. 428-225.000.
Ishiwata, Ichiro, to Nippon Air Brake Co., Ltd. Hydraulic reservoir for tandem master cylinder. 4,514,980, Cl. 60-534.000.
Ito, Kunihiko: *See—*
Aoki, Akira; and Ito, Kunihiko, 4,514,869, Cl. 5-472.000.
Ito, Takeshi, to Coret & Co. Ltd.; and Machine Engineering Co., Ltd. Fly reel. 4,515,325, Cl. 242-84.51R.
Ito, Tosikazu; Komathuzaki, Kiyomi; Chonan, Kenichi; and Horibe, Kiyoshi, to Hitachi, Ltd. Vacuum actuator. 4,515,066, Cl. 91-454.000.
Itoh, Hidekuni, to Kabushiki Kaisha Showa Seisakusho. Damping force generating device for an oil damper. 4,515,253, Cl. 188-314.000.
Itoki Kosakusho Co. Ltd.: *See—*
Takamatsu, Shunicti, 4,515,508, Cl. 414-280.000.
Ittipiboon, Apisak; Shafai, Lotfollah; and Bridges, Ernest, to Canadian Patents & Dev. Ltd. Waveguide with dielectric coated flange antenna feed. 4,516,129, Cl. 343-772.000.
IVAC Corporation: *See—*
Hemmerich, Karl J.; Millerd, Donald L.; and Semedo, Anthony B., 4,515,591, Cl. 604-152.000.
Iverson, Kjeld K. Barbecue cooking unit. 4,515,074, Cl. 99-393.000.
Iwahashi, Hiroyuki: *See—*
Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Nishioka, Yoshiki, 4,516,215, Cl. 364-513.500.
Iwamoto, Masanori: *See—*
Kizu, Shuji; Ikeda, Tsutomu; and Iwamoto, Masanori, 4,516,265, Cl. 382-48.000.
Iwanaga, Takeya: *See—*
Kambara, Toru; Uemura, Michihiko; and Iwanaga, Takeya, 4,516,090, Cl. 333-141.000.
Iwasaki, Akio; Deushi, Takeo; Watanabe, Isamu; and Mori, Toshihito, to Kowa Company, Ltd. Antibiotics KA-6606 XII, XIII, XV, XVI and XVII. 4,515,942, Cl. 536-16.800.
Iwasaki, Yoshiki: *See—*
Masuda, Isao; Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Ueno, Shoji, 4,516,163, Cl. 360-32.000.
Iwasawa, Hiroshi; Numata, Masanori; and Mama, Shinichi, to Amano Corporation. Time-clock recording and computation apparatus with optional rest processing function. 4,516,138, Cl. 346-80.000.
Iwata, Kazuro: *See—*
Hidaka, Kunihiko; Fukushima, Naoto; and Iwata, Kazuro, 4,515,252, Cl. 188-282.000.
Iwata, Masao: *See—*
Enomoto, Kiyoshige; and Iwata, Masao, 4,515,140, Cl. 123-603.000.
Iwataki, Isao; Fujita, Kagari; Ishikawa, Hisao; Hosaka, Hideo; and Kohara, Kenichi, to Nippon Soda Company Limited. Cyclohexane derivatives. 4,515,729, Cl. 260-464.000.
Iwatani, Kenji: *See—*
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Iyoda, Tetsuo: *See—*
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihasa, 4,516,134, Cl. 346-75.000.
Izumi, Masaro: *See—*
Shibata, Yoichi; Kimura, Ryosuke; Sumigama, Takashi; and Izumi, Masaro, 4,515,350, Cl. 266-92.000.
J. I. Case Company: *See—*
Parquet, Donald J.; Brown, Thomas R.; and Edwards, Eldon R., 4,515,520, Cl. 414-718.000.
Jabas, Florian H. Moving air oven for baking and the like. 4,515,143, Cl. 126-21.00A.
Jaber, Khalil N.: *See—*
Broaddus, Wayne R.; Jaber, Khalil N.; and Orofino, Thomas A., 4,515,839, Cl. 428-17.000.
Jackson, Douglas H.: *See—*
Heathcoat, Michael J.; Jackson, Douglas H.; Jowitt, Frederick W.; Madley, Jack R.; and Stuart, Ian C. E., 4,515,677, Cl. 204-300.0EC.
Jacobelli, Alain: *See—*
Hartemann, Pierre; Meunier, Paul-Louis; and Jacobelli, Alain, 4,515,016, Cl. 73-517.00R.
Jacobs, Pierre: *See—*
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,515,905, Cl. 502-309.000.
Jacobson, Roger K.; and Munson, Ronald W., to Bemis Company, Inc. Bag with tab and method of forming. 4,515,273, Cl. 206-604.000.
Jacoby, Charles E., to SI Handling Systems, Inc. Track for driverless vehicles. 4,515,084, Cl. 104-166.000.
Jacquemin, Claude; Provost, Florent; and Seinera, Andre , to Ugine Aciers. Grill element of cast metal for solid-fluid heat exchange at very high temperature comprising a latching device which is integrated in the grill structure. 4,515,560, Cl. 432-80.000.
Jaenson, Howard W., to Jenglo Engineering, Inc. Welded wire fabric bending apparatus and method. 4,515,004, Cl. 72-388.000.
Jaggle, Gunther; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schutz, Rudolf, to Robert Bosch GmbH. Fuel injection system. 4,515,128, Cl. 123-454.000.
Janes, Norman F.: *See—*
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,515,808, Cl. 514-521.000.
Janich, Hans-Jurgen, to PKS-Engineering GmbH & Co. KG. Method for the operation of an air separator, and an air separator for the practice of the method. 4,515,686, Cl. 209-139.00A.
Janis, James. Security system window guard apparatus and anchor assembly therefor. 4,514,932, Cl. 49-50.000.
Janson, David A., to Ford Motor Company. Chain driven reverse gear for a manual transmission. 4,515,031, Cl. 74-359.000.
Janusch, Alois; and Mayer, Franz, to Voest-Alpine Aktiengesellschaft. Process for drying or organic solid materials, particularly brown coals. 4,514,912, Cl. 34-37.000.
Japan Radio Company, Limited: *See—*
Matsumoto, Shigeru; Okabe, Yoshikatsu; and Kazama, Yasuhiro, 4,516,133, Cl. 343-819.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Sakakibara, Mitsuhiko; Yoshizawa, Masao; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,515,922, Cl. 525-99.000.
Jaras, Sven G.: *See—*
Otterstedt, Jan-Erik A.; Jaras, Sven G.; Pudas, Roland; and Upson, Lawrence L., 4,515,903, Cl. 502-68.000.
Jardinier, Pierre; and Simonnot, Jack, to Societe d'Etudes et de Recherches de Ventilation et d'Aerauliques. Flow stabilizer for a ventilation duct. 4,515,308, Cl. 236-49.000.
Jaskolski, Stanley V.; Schutten, Herman P.; Spellman, Gordon B.; Sedivy, Jan K.; and Jensen, Maurice W., to Eaton Corporation. Columnated and trimmed magnetically sensitive semiconductor. 4,516,144, Cl. 357-27.000.
Jasserand, Daniel: *See—*
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,515,944, Cl. 544-91.000.
Jefferies, Derek K.: *See—*
Prewett, Phillip D.; Jefferies, Derek K.; Pashley, Neil A.; and Cockhill, Thomas D., 4,516,052, Cl. 313-546.000.

Jeffress, Ronald E.; Wanat, David J.; and Krasznai, Charles Z., to Black & Decker, Inc. Portable electric appliance for steaming hair rollers prior to use. 4,516,011, Cl. 219-222.000.

JENAer Glaswerk, Schott & Gen.: *See*—
Gunthner, Frantz, 4,515,621, Cl. 65-171.000.

Jenglo Engineering, Inc.: *See*—
Jaenson, Howard W., 4,515,004, Cl. 72-388.000.

Jenkins, Anthony W.: *See*—
Newman, Peter M.; and Jenkins, Anthony W., 4,515,805, Cl. 514-460.000.

Jenkins, Patrick A.; and Ferguson, Donald A., to Borg-Warner Corporation. Valve testing system utilizing an artificial atmosphere. 4,515,012, Cl. 73-168.000.

Jensen, Maurice W.: *See*—
Jaskolski, Stanley V.; Schutten, Herman P.; Spellman, Gordon B.; Sedivy, Jan K.; and Jensen, Maurice W., 4,516,144, Cl. 357-27.000.

Jensen, Neil B. Wheel chair with displaceable seat panel. 4,514,867, Cl. 4-480.000.

Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Thermal break skylight. 4,514,943, Cl. 52-200.000.

Jeumont-Schneider Corporation: *See*—
Trouillet, Jean, 4,515,495, Cl. 403-336.000.

Jirkovsky, Ivo: *See*—
Santroch, George; and Jirkovsky, Ivo, 4,515,949, Cl. 544-343.000.

Johansson, Bengt, to Maskingruppen 82 AB. Roof panel mounting clip. 4,514,952, Cl. 52-713.000.

Johns, David L., to Suncoast Medical Manufacturing Co. Pen light. 4,516,194, Cl. 362-202.000.

Johnsey, Walter F.: *See*—
Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., 4,515,229, Cl. 175-337.000.

Johnson, Duane R., to Allied Corporation. Clutch drive with link spring. 4,515,258, Cl. 192-91.00A.

Johnson, Ernest L. Dice and blackjack game board. 4,515,369, Cl. 273-243.000.

Johnson, Gilbert. Retractable torque applying tool. 4,515,046, Cl. 81-436.000.

Johnson & Johnson Dental Products Company: *See*—
Wu, Jenn-Ming; Cannon, Warren R.; and Panzera, Carlino, 4,515,634, Cl. 106-35.000.

Johnson, Leonard M., to Massachusetts Institute of Technology. Integrated optical transducers. 4,515,430, Cl. 350-96.130.

Johnson, Leslie V. Rotary seal assembly having a liquid filled bellows. 4,515,377, Cl. 277-27.000.

Johnson, Michael D., to Becton, Dickinson and Company. Slip resistant surfaces. 4,515,851, Cl. 428-246.000.

Johnson, Randolph K., to Idttkow, Inc. Insulated barrel cooler. 4,514,993, Cl. 62-372.000.

Johnson, Ray M.; and Dremann, George H. Power absorbing termination for a waveguide transmission line. 4,516,088, Cl. 333-22.00F.

Johnson Service Company: *See*—
Seaks, Charles E., Jr., 4,516,189, Cl. 361-426.000.

Johnston, Margaret I.: *See*—
Torrence, Paul F.; Johnston, Margaret I.; and Imai, Jiro, 4,515,781, Cl. 514-46.000.

Jones, Gary A., to Pertron Controls Corporation. System for calculating the root mean square (RMS) current in a resistance welding system. 4,516,008, Cl. 219-109.000.

Jones, John C.: *See*—
Heward, Peter D.; Jones, Valerie A.; and Jones, John C., 4,515,510, Cl. 414-422.000.

Jones, L. Raymond, Jr.: *See*—
Cassidy, John E.; and Jones, L. Raymond, Jr., 4,515,485, Cl. 374-157.000.

Jones, Valerie A.: *See*—
Heward, Peter D.; Jones, Valerie A.; and Jones, John C., 4,515,510, Cl. 414-422.000.

Jonsson, Karl-Erik A. Cutting tool and holder. 4,515,193, Cl. 144-172.000.

Jordan Chemical Company: *See*—
Login, Robert B.; Walele, Ismail L.; and Otterson, Richard J., 4,515,721, Cl. 260-400.000.

Jouffrey, Bernard; Trinquier, Jacques; and Franceschi, Jean-Luc, to Centre National de la Recherche Scientifique CNRS. Scanning electron microscope assembly operating in situ. 4,516,026, Cl. 250-310.000.

Jowitt, Frederick W.: *See*—
Heathcoat, Michael J.; Jackson, Douglas H.; Jowitt, Frederick W.; Madley, Jack R.; and Stuart, Ian C. E., 4,515,677, Cl. 204-300.0EC.

Joy Manufacturing Company: *See*—
Hollister, F. Harold; and Meyer, Danny S., 4,515,174, Cl. 137-72.000.
Sitton, Willard J.; and Whaley, William L., 4,515,347, Cl. 251-328.000.

Joyce, William B.: *See*—
Dixon, Richard W.; Joyce, William B.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,514,896, Cl. 29-576.00B.

JSJ Corporation: *See*—
Olmsted, Bruce E., 4,515,032, Cl. 74-473.00R.

Juenger, Rudolf, to Akzona Incorporated. Cleaning control through measurement of electrical conductivity. 4,515,641, Cl. 134-5.000.

Jufuku, Yasunobu: *See*—
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.

Jullien, Georges, to Novatome. Apparatus for the production of steam by heat exchange between a heat-transfer liquid metal and feed water, comprising several liquid metal/inert gas interfaces. 4,515,109, Cl. 122-32.000.

Jung, Eggert; and Wadle, Heinrich, to Dr. Ing. Rudolf Hell GmbH. Scanning method and scanning diaphragm for suppressing Moire in the scanning of rastered masters. 4,516,175, Cl. 358-283.000.

Jung, Johann: *See*—
Rentzea, Costin; Spiegler, Wolfgang; and Jung, Johann, 4,515,616, Cl. 71-76.000.

Juridicial Foundation, The Chemo-Semo-Sero-Therapeutic Research Institute: *See*—
Kawahara, Tetsuo; Mizokami, Hiroshi; Mizuno, Kyosuke; and Susumi, Sadao, 4,515,714, Cl. 260-112.00R.

Jury, Harold R. Metal forming machine. 4,514,998, Cl. 72-184.000.

Justice, David D.: *See*—
Fair, David L.; Justice, David D.; and Kelly, Pilar P., 4,515,665, Cl. 204-98.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Kitano, Seiichi; and Ono, Yukio, 4,515,256, Cl. 192-18.00R.

Kabushiki Kaisha Daini Seikosha: *See*—
Momoshima, Yukichi; and Nagasaka, Nobuyuki, 4,515,057, Cl. 84-1.030.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Ishida, Takehisa, 4,515,231, Cl. 177-25.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Narita, Kiichi; Mori, Takasuke; and Ayata, Kenzo, 4,515,203, Cl. 164-468.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Okubo, Junpei, 4,515,115, Cl. 123-52.00M.

Kabushiki Kaisha Nagaoka: *See*—
Yamaguchi, Izumi, 4,514,908, Cl. 33-365.000.

Kabushiki Kaisha Showa Seisakusho: *See*—
Itoh, Hidekuni, 4,515,253, Cl. 188-314.000.

Kabushiki Kaisha Toshiba: *See*—
Takahara, Takeshi; Ishii, Tsutomu; and Shirakawa, Yasuhiro, 4,515,706, Cl. 252-301.40H.

Kadowaki, Yoshihiko, to Hitachi, Ltd. Interface control system for high speed processing based on comparison of sampled data values to expected values. 4,516,202, Cl. 364-200.000.

Kahl, William G., Jr.: *See*—
Frigon, Raymond A.; and Kahl, William G., Jr., 4,516,115, Cl. 340-556.000.

Kahlman, Sture. Method to cut off a preferably band shaped running web of tearable material and means to carry out the method. 4,515,321, Cl. 242-56.00R.

Kahn, Roger N.: *See*—
DuVal, Daniel A.; Kahn, Roger N.; and Myers, David E., 4,515,396, Cl. 281-15.00R.

Kai, Junichi: *See*—
Tsuchikawa, Haruo; and Kai, Junichi, 4,516,030, Cl. 250-492.200.

Kajigaya, Shinichi; and Nakaya, Mitsuo, to Bridgestone Tire Company Limited. Marine fenders. 4,515,502, Cl. 405-215.000.

Kajino, Yukio. Method of and apparatus for igniting internal combustion engine. 4,515,117, Cl. 123-146.50A.

Kajiyama, Ryuichi; and Yonemoto, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling the arrival of an elevator cage at an elevator floor. 4,515,246, Cl. 187-29.00R.

Kajiyama, Sigeru, to Hitachi, Ltd. Guide rail apparatus for an object running around piping. 4,515,018, Cl. 73-637.000.

Kaken Pharmaceutical Co., Ltd.: *See*—
Nakano, Jun; Nakanishi, Teruo; and Kimura, Kazuhiko, 4,515,977, Cl. 549-468.000.

Kakuda, Yukio: *See*—
MacDonald, Bruce E.; Galloway, Geoffrey; and Kakuda, Yukio, 4,515,818, Cl. 426-268.000.

Kalama Chemical, Inc.: *See*—
Marinak, Michael J.; and Simonson, John L., 4,515,953, Cl. 546-345.000.

Kali-Chemie Pharma GmbH: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,515,944, Cl. 544-91.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Lohn, Gerd, 4,515,564, Cl. 433-126.000.

Kamada, Toshihiko, to Kamatari Co., Ltd. Golf gloves. 4,514,861, Cl. 2-161.00A.

Kamatari Co., Ltd.: *See*—
Kamada, Toshihiko, 4,514,861, Cl. 2-161.00A.

Kambara, Toru; Uemura, Michihiko; and Iwanaga, Takeya, to Asahi Glass Company Ltd. Ultrasonic delay line. 4,516,090, Cl. 333-141.000.

Kammoto, Yoshiaki, to Ricoh Company, Ltd. Video signal regulating apparatus. 4,516,174, Cl. 358-282.000.

Kamp, Ewald A., to Union Carbide Corporation. Pentabar closure device. 4,516,268, Cl. 383-63.000.

Kamyr, Inc.: *See*—
Elmore, Carl L.; and Funk, Erwin D., 4,514,910, Cl. 34-15.000.

Kanai, Hideyuki: *See*—
Imai, Motomasa; Takahashi, Takashi; Furukawa, Osamu; and Kanai, Hideyuki, 4,516,105, Cl. 338-21.000.

Kanamaru, Hitoshi, to Universal Pioneer Corporation. Information recording and reproducing system. 4,516,160, Cl. 358-326.000.

Kanamori, Takashi, to Yamaha Hatsudoki Kabushiki Kaisha. Rear suspension for motorcycles. 4,515,236, Cl. 180-227.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Uda, Junji; Yamamoto, Tsuneo; and Kosugi, Takumi, 4,515,915, Cl. 524-87.000.
Kaneko, Katsukichi. Double-slider fastening lock. 4,514,884, Cl. 24-386.000.
Kaneko, Yasunori: *See*—
Maki, Masao; Kaneko, Yasunori; and Kobayashi, Ikuo, 4,515,862, Cl. 428-450.000.
Kangol Magnet Limited: *See*—
Patterson, Michael, 4,515,395, Cl. 280-808.000.
Kania, Don R.: *See*—
Zimmermann, Eugene L.; and Kania, Don R., 4,515,173, Cl. 137-68.00R.
Kaniecki, Michael; Landers, Samuel P.; and Botzman, Thomas J., to Goodyear Tire & Rubber Company, The. Coating material for use on sulfur vulcanized rubber. 4,515,199, Cl. 152-353.00R.
Kanzaki Paper Mfg. Co., Ltd.: *See*—
Nojima, Kazuhiro; Fujimoto, Hiroyuki; and Takahashi, Mikio, 4,515,833, Cl. 427-362.000.
Kao Corporation: *See*—
Tsuneno, Tatsuro; and Takaku, Masaaki, 4,515,725, Cl. 260-410.700.
Kao Soap Co., Ltd.: *See*—
Katabe, Kenichi; and Nishimura, Takeo, 4,515,852, Cl. 428-246.000.
Karavaev, Alexandr A.: *See*—
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; and Karavaev, Alexandr A., 4,515,157, Cl. 128-303.00R.
Karino, Saburo; and Ishida, Yoshiaki, to Dainippin Ink and Chemicals Inc. Process for producing composite plastic pipe. 4,515,737, Cl. 264-22.000.
Karlsson, Hans I. R. Arrangement for locking the winding device of a vehicle safety-belt. 4,515,326, Cl. 242-107.40A.
Karwat, Heinz: *See*—
Lang, Roland; and Karwat, Heinz, 4,515,760, Cl. 423-220.000.
Kaschig, Jurgen; Kleiner, Eduard K.; Nueller, Karl F.; and Cooke, Thomas W., to Ciba Geigy Corporation. Fluoroaliphatic-thio,-sulfinyl, or sulfonyl substituted bicycloaliphatic amic acid amine salts, and compositions and use thereof. 4,515,640, Cl. 106-287.250.
Kaser, Adolf, to Ciba Geigy Corporation. Process for dyeing paper. 4,515,599, Cl. 8-685.000.
Kashio, Toshio, to Casio Computer Co. Ltd. Electronic musical instrument. 4,515,056, Cl. 84-1.010.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,515,389, Cl. 280-642.000.
Kassai, Kenzou, to Kassai Kabushikikaisha. Baby carriage and armrest for such baby carriage. 4,515,389, Cl. 280-642.000.
Kastell, Wolfgang. Preparation for conditioning and grooming the hair. 4,515,778, Cl. 424-95.000.
Kasuya, Yukio: *See*—
Masuda, Shunichi; Yagasaki, Toshiaki; and Kasuya, Yukio, 4,515,458, Cl. 355-3.0SH.
Katabe, Kenichi; and Nishimura, Takeo, to Kuraray Co., Ltd.; and Kao Soap Co., Ltd. Leather-like sheet material having low slip characteristics. 4,515,852, Cl. 428-246.000.
Kataishi, Takao; and Seo, Iwazou, to Misawa Home Co., Ltd. Release and carry-out apparatus. 4,515,552, Cl. 425-436.0RM.
Katakura, Masayuki, to Sony Corporation. Voltage controlled variable gain circuit. 4,516,081, Cl. 330-254.000.
Katalistiks B.V.: *See*—
Otterstedt, Jan-Erik A.; Jaras, Sven G.; Pudas, Roland; and Upson, Lawrence L., 4,515,903, Cl. 502-68.000.
Kataoka, Takeshi; Aoki, Ryoichi; Matsui, Hisashi; and Matsumoto, Hiroshi, to Ono Seiko Co., Ltd. Clutch mechanism of a push-button tuner. 4,515,024, Cl. 74-10.330.
Kather, Kenneth C.: *See*—
Nowobilski, Jeffert J.; and Kather, Kenneth C., 4,515,397, Cl. 285-47.000.
Katsuoka, Tatsuzo, to Yamaha Hatsudoki Kabushiki Kaisha. Four-cycle engine. 4,515,127, Cl. 123-430.000.
Kaule, Wittich; Renz, Walter; and Stenzel, Gerhard, to GAO Gesellschaft fur Automation und Organisation mbH. Method of determining the degree of wear of bank-notes and a device for carrying out this method. 4,516,031, Cl. 250-562.000.
Kawabe, Toshihiko: *See*—
Amemori, Koichi; Kawabe, Toshihiko; and Takahashi, Yosuke, 4,515,120, Cl. 123-368.000.
Kawagoe, Hiroto, to Hitachi, Ltd. Semiconductor integrated circuit device manufacturing method. 4,514,894, Cl. 29-571.000.
Kawaguchi, Masayuki: *See*—
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,515,709, Cl. 252-509.000.
Kawaguchi, Mitsuru, to Kotobuki Engineering & Mfg Company, Ltd. Method of withdrawing particulate material from dead-bed of centrifugal crusher and centrifugal crusher suitable for carrying the method into practice. 4,515,316, Cl. 241-5.000.
Kawahara, Tetsuo; Mizokami, Hiroshi; Mizuno, Kyosuke; and Susumi, Sadao, to Juridicial Foundation, The Chemo-Semo-Sero-Therapeutic Research Institute. Method for purification of hepatitis B virus surface antigen. 4,515,714, Cl. 260-112.00R.
Kawahara, Yoshihiro; and Hayashi, Kiyoshi, to Mita Industrial Company Limited. Electrostatic recording apparatus. 4,516,141, Cl. 346-153.100.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,515,058, Cl. 84-1.240.
Kawai, Yasuhiro: *See*—
Yamamoto, Takaaki; and Kawai, Yasuhiro, 4,516,142, Cl. 346-160.000.
Kawai, Yoshio; and Kitagawa, Kiyoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cell unit for observing electrophoresis. 4,515,676, Cl. 204-299.00R.
Kawamori, Ryuzo: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Kawamura, Hideaki: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Fujibayashi, Kentaro, 4,516,211, Cl. 364-474.000.
Kawasaki, Kiyoshi: *See*—
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,515,352, Cl. 266-218.000.
Kawashima, Kenichi: *See*—
Hayase, Isao; Suginuma, Atsushi; Kishi, Atsuo; and Kawashima, Kenichi, 4,515,514, Cl. 418-150.000.
Kawata, Shigeo: *See*—
Yokogawa, Kanae; Kotani, Shozo; Kawata, Shigeo; and Takase, Yoshiyuki, 4,515,891, Cl. 435-69.000.
Kay, Ian T.; and Noon, Robert A., to Imperial Chemical Industries PLC. Biologically active amides. 4,515,959, Cl. 548-378.000.
Kaye, Arthur; Carr, Brian; and Latham, Philip A., to British Aerospace Public Limited Company. Control apparatus. 4,516,063, Cl. 318-685.000.
Kazama, Yasuhiro: *See*—
Matsumoto, Shigeru; Okabe, Yoshikatsu; and Kazama, Yasuhiro, 4,516,133, Cl. 343-819.000.
Kearns, William F. Oscillator proximity switch. 4,516,229, Cl. 367-95.000.
Keimel, John G., to Medtronic, Inc. Cardiac pacemaker synchronized programming. 4,515,160, Cl. 128-419.0PG.
Keino, Goro; Kitagawa, Yosuke; and Hayashi, Yoshimi, to Matsui Shikiso Chemical Co. Ltd. Transfer printing sheet, printing method and printed article. 4,515,849, Cl. 428-201.000.
Keiper Automobiltechnik GmbH & Co. KG.: *See*—
Kluting, Bernd; and Engels, Bernd, 4,515,339, Cl. 248-543.000.
Keithler, William R.: *See*—
Bradley, Robert E.; and Keithler, William R., 4,515,919, Cl. 524-591.000.
Keller, David J.: *See*—
Merritt, Carleton G.; Wingerd, Winston H.; and Keller, David J., 4,515,769, Cl. 424-49.000.
Keller, Douglas V., Jr.; and Simmons, Frederick J., to Otisca Limited, Ltd. Coal compositions. 4,515,602, Cl. 44-51.000.
Keller, Robert D., Jr.: *See*—
Isenberg, Gerry E.; Forshey, Terry L.; and Keller, Robert D., Jr., 4,515,353, Cl. 266-236.000.
Kelly, Joseph L., Jr.: *See*—
Dolezal, George E.; and Kelly, Joseph L., Jr., 4,515,228, Cl. 175-313.000.
Kelly, Pilar P.: *See*—
Fair, David L.; Justice, David D.; and Kelly, Pilar P., 4,515,665, Cl. 204-98.000.
Kemper, Kyran B.: *See*—
Brown, James M.; and Kemper, Kyran B., 4,516,070, Cl. 324-117.00R.
Kendall Company, The: *See*—
Pendergrass, John E.; and Melton, David T., 4,515,594, Cl. 604-384.000.
Kenemuth, James A., to Prentice Corporation. Data compression system. 4,516,246, Cl. 375-37.000.
Kennedy, Richard B., to Fricke, Richard J.; and Crehan, Patrick J. Stabilization of the B-side. 4,515,638, Cl. 106-162.000.
Kent, Garnet J.; and Wood, John C., to W. R. Grace & Co., Cryovac Div. Hang bag. 4,516,267, Cl. 383-22.000.
Kernasovsky, Ilya S.: *See*—
Markov, Vladimir A.; Filatov, Vladimir N.; Kernasovsky, Ilya S.; and Gorina, Ljudmila V., 4,515,254, Cl. 188-371.000.
Kershaw, Mervyn G.: *See*—
Matthew, Ian G.; Pammenter, Robert V.; and Kershaw, Mervyn G., 4,515,696, Cl. 210-713.000.
Kershner, Daniel E. Recreational pool implement. 4,515,023, Cl. 73-864.510.
Kessler, Claus, to Siemens Aktiengesellschaft. Logic card. 4,516,188, Cl. 361-408.000.
Kessler, Jochen, to Dr. Ing. h.c.F. Porsche AG. Device for damping periodically alternating longitudinal accelerations of a motor vehicle. 4,515,126, Cl. 123-401.000.
Khambay, Bhupinder P. S.: *See*—
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,515,808, Cl. 514-521.000.
Khera, Muhammad I.: *See*—
Perry, Thomas J.; and Khera, Muhammad I., 4,516,237, Cl. 370-58.000.
Kholodov, Valery F.: *See*—
Maidanik, Jury F.; Vershinin, Sergei V.; Kholodov, Valery F.; and Dolgirev, Jury E., 4,515,209, Cl. 165-104.220.
Khromov, Sergei V.: *See*—
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; and Karavaev, Alexandr A., 4,515,157, Cl. 128-303.00R.

Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., to Vsesojuzny Nauchno-Issledovatelsky Institut Gornospasatelngo Dela. Regenerative canister of a self-contained oxygen-breathing apparatus on chemically fixed oxygen. 4,515,156, Cl. 128-202.260.

KIA Industrial Co., Inc.: *See*—
Ha, Jung Y., 4,515,259, Cl. 192-3.00H.

Kida, Shinji: *See*—
Otsuki, Masaaki; and Kida, Shinji, 4,515,979, Cl. 556-445.000.

Kiefer, Werner: *See*—
Sack, Werner; and Kiefer, Werner, 4,515,897, Cl. 501-15.000.

Kieser, Jorg; Kukla, Reiner; and Deppisch, Gerd, to Leybold-Heraeus GmbH. Magnetron cathode for cathodic evaportion apparatus. 4,515,675, Cl. 204-298.000.

Kievit, David J.; and Osterhage, Thomas F., to Procter & Gamble Company, The. Disposable diapers with elastically contractible waistbands. 4,515,595, Cl. 604-385.00A.

Kihara, Tomohiko: *See*—
Yamakawa, Tsutomu; Nishikawa, Mineki; and Kihara, Tomohiko, 4,516,025, Cl. 250-252.100.

Kimura, Hiroshi: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikawa, Yasuhiko; and Nagashima, Takashi, 4,515,464, Cl. 355-14.00R.

Kimura, Kazuhiko: *See*—
Nakano, Jun; Nakanishi, Teruo; and Kimura, Kazuhiko, 4,515,977, Cl. 549-468.000.

Kimura, Ryosuke: *See*—
Shibata, Yoichi; Kimura, Ryosuke; Sumigama, Takashi; and Izumi, Masaro, 4,515,350, Cl. 266-92.000.

Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Torque transmission system. 4,515,575, Cl. 474-13.000.

King, Homer F., to H. King & Associates, Ltd. Display shelf construction. 4,515,279, Cl. 211-153.000.

Kinner, Josef: *See*—
Krasser, Fritz; and Kinner, Josef, 4,516,098, Cl. 335-35.000.

Kinoshita, Akira: *See*—
Sawada, Kiyoshi; Goto, Satoshi; Kinoshita, Akira; and Sasaki, Osamu, 4,515,881, Cl. 430-58.000.

Kinsbron, Eliezer; Lynch, William T.; and Smith, Thomas E., to AT&T Bell Laboratories. Fabrication of FETs. 4,514,893, Cl. 29-571.000.

Kirby, Edward R., to Associated Truss Company. Method and apparatus for attaching mounting plates. 4,514,901, Cl. 29-822.000.

Kirschenmann, Bernd R. G., to Alfa-Laval AB. Process for separation of raw milk into cream and skim milk which is pasteurized. 4,515,823, Cl. 426-491.000.

Kirschner, Thomas F., to RCA Corporation. Disc record player having player control apparatus. 4,516,233, Cl. 369-79.000.

Kishi, Atsuo: *See*—
Hayase, Isao; Mizukami, Masao; and Kishi, Atsuo, 4,515,513, Cl. 418-101.000.
Hayase, Isao; Suginuma, Atsushi; Kishi, Atsuo; and Kawashima, Kenichi, 4,515,514, Cl. 418-150.000.

Kitada, Fumihiko: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 4,515,557, Cl. 431-302.000.

Kitagawa, Hiroshi: *See*—
Adachi, Kiyoshi; Uehara, Masaru; Kitagawa, Hiroshi; Kojima, Hirotaka; and Sato, Masaaki, 4,514,965, Cl. 53-553.000.

Kitagawa, Kiyoshi: *See*—
Kawai, Yoshio; and Kitagawa, Kiyoshi, 4,515,676, Cl. 204-299.00R.

Kitagawa, Yosuke: *See*—
Keino, Goro; Kitagawa, Yosuke; and Hayashi, Yoshimi, 4,515,849, Cl. 428-201.000.

Kitahara, Takeshi: *See*—
Abe, Susumu; Munakata, Akio; and Kitahara, Takeshi, 4,516,173, Cl. 358-261.000.

Kitamoto, Tatsuji; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,515,857, Cl. 428-328.000.

Kitano, Seiichi; and Ono, Yukio, to Kabushiki Kaisha Daikin Seisakusho. Clutch and brake unit. 4,515,256, Cl. 192-18.00R.

Kitayama, Seishi: *See*—
Yato, Fumihiro; Kitayama, Seishi; and Kurematsu, Akira, 4,516,259, Cl. 381-36.000.

Kitchin, Jonathan P.: *See*—
Beretta, Paolo; and Kitchin, Jonathan P., 4,515,888, Cl. 430-584.000.

Kitzmiller, George R. Solar clothes dryer. 4,514,914, Cl. 34-93.000.

Kiru, Shuji; Ikeda, Tsutomu; and Iwamoto, Masanori, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical character reader. 4,516,265, Cl. 382-48.000.

Klay, William F. Door lock. 4,515,401, Cl. 292-170.000.

Kleemann, Wolfgang: *See*—
Klose, Sigmar; Stahler, Fritz; Lange, Hans; and Kleemann, Wolfgang, 4,515,889, Cl. 435-4.000.

Klein, Gunter, to GESIPA Blindniettechnik Gesellschaft mit beschrankter Haftung. Hydropneumatic blind riveter with automatic mandrel catcher. 4,515,005, Cl. 72-391.000.

Klein, Kenneth: *See*—
Conner, Donald E.; and Klein, Kenneth, 4,515,774, Cl. 424-59.000.

Klein, Rolf D.: *See*—
Eing A., Hubert I.; and Klein, Rolf D., 4,516,205, Cl. 364-200.000.

Kleiner, Eduard K.: *See*—
Kaschig, Jurgen; Kleiner, Eduard K.; Nueller, Karl F.; and Cooke, Thomas W., 4,515,640, Cl. 106-287.250.

Kleiner, Frank; Kubens, Rolf; Reese, Eckart; and Wank, Joachim, to Bayer Aktiengesellschaft. Polycarbonate/polybutylene terephthalate film. 4,515,925, Cl. 525-439.000.

Kleinewefers GmbH: *See*—
Rauf, Richard; Pav, Josef; and Scholl, Klaus, 4,514,887, Cl. 29-116.0AD.

Kleschick, William A., to Dow Chemical Company, The. Selective preparation of isomers and enantiomers of cyclopropane carboxylic acids. 4,515,956, Cl. 548-230.000.

Klie, Juergen: *See*—
Hennig, Eberhard; Klie, Juergen; and Wellendorf, Klaus, 4,516,155, Cl. 358-80.000.

Klimsch/Optronics: *See*—
Morrill, David R.; Mason, Mark T.; and Green, Paul M., 4,516,023, Cl. 250-235.000.

Kline, James R.; and Brand, Peter, to Acutherm, Ltd. Change-over diffuser. 4,515,069, Cl. 98-40.00D.

Kline, Mark H.: *See*—
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,516,199, Cl. 364-200.000.

Klingenstein, Klaus: *See*—
Schadlich, Fritz; Rieker, Werner; Thaler, Rainer; and Klingenstein, Klaus, 4,515,303, Cl. 227-131.000.

Kloots, Jacobus, to Luxtec Corporation. Surgical headlamp. 4,516,190, Cl. 362-32.000.

Klose, Sigmar; Stahler, Fritz; Lange, Hans; and Kleemann, Wolfgang, to Boehringer Mannheim GmbH. Method for carrying out analytical determinations. 4,515,889, Cl. 435-4.000.

Klotz, Erhard: *See*—
Harding, Geoffrey; and Klotz, Erhard, 4,516,261, Cl. 382-6.000.
Linde, Rolf; and Klotz, Erhard, 4,516,252, Cl. 378-23.000.

Kluting, Bernd; and Engels, Bernd, to Keiper Automobiltechnik GmbH & Co. KG. Height adjustment arrangement for seats, particularly motor vehicle seats. 4,515,339, Cl. 248-543.000.

Knabel, Walter: *See*—
Emert, Anton; Knabel, Walter; and Richert, Manfred, 4,515,388, Cl. 280-605.000.

Knaster, Mark, to Henkel Kommanditgesellschaft auf Aktien. Method for determining and adjusting the potency and effectiveness of a metal phosphate conversion coating process. 4,515,643, Cl. 148-6.15Z.

Knauer, Scott C.: *See*—
Huang, Alan; and Knauer, Scott C., 4,516,238, Cl. 370-60.000.

Knechtel, Wilhelm, to Canon Kabushiki Kaisha. Device for transferring color toner images. 4,515,460, Cl. 355-3.0TR.

Knepper, J. Irvine; and Sallee, Dennis C., to Petrolite Corporation. Anti-static compositions. 4,515,603, Cl. 44-62.000.

Kniep, Claus: *See*—
Bernhagen, Wolfgang; Falk, Volker; Springer, Helmut; Weber, Jurgen; Wiebus, Ernst; and Kniep, Claus, 4,515,986, Cl. 564-471.000.

Knothe, Herbert: *See*—
Borchard, Heinz; Knothe, Herbert; and Rybka, Bruno, 4,515,843, Cl. 428-64.000.

Knupp, John L., Jr., to E.I. Du Pont de Nemours and Company. Extraction of substances from aqueous solution. 4,515,695, Cl. 210-634.000.

Knutson, Richard K.: *See*—
Blake, Jon R.; Knutson, Richard K.; and VanHulle, Glenn J., 4,515,824, Cl. 426-554.000.

Kobayashi, Akio; Mizoguchi, Hitoshi; Ikeda, Hisatoshi; and Mayama, Hidekiyo, to Tokyo Shibaura Denki Kabushiki Kaisha. Puffer type gas-blast circuit breaker. 4,516,006, Cl. 200-148.00A.

Kobayashi, Ikuo: *See*—
Maki, Masao; Kaneko, Yasunori; and Kobayashi, Ikuo, 4,515,862, Cl. 428-450.000.

Kobayashi, Yukiharu: *See*—
Miya, Toyofumi; Kobayashi, Yukiharu; and Yano, Masao, 4,515,943, Cl. 536-27.000.

Kobe Steel, Ltd.: *See*—
Morimoto, Kotaro; and Suzuki, Tomio, 4,515,553, Cl. 431-8.000.

Koberstein, Edgar: *See*—
Domesle, Rainer; Koberstein, Edgar; Pletka, Hans-Dieter; and Voelker, Herbert, 4,515,758, Cl. 423-213.200.

Kocher, Haribhajan S.: *See*—
Field, John R.; Kocher, Haribhajan S.; and Martellock, Arthur C., 4,515,884, Cl. 430-99.000.

Kocherga, Vladimir K.: *See*—
Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., 4,515,156, Cl. 128-202.260.

Kodron, Rudolf S. Apparatus for recording and processing guest orders in restaurants or the like. 4,516,016, Cl. 235-472.000.

Koenig, Karl-Heinz: *See*—
Husslein, Gerd; Hamprecht, Gerhard; Koenig, Karl-Heinz; Boehm, Walter; and Gaeng, Manfred, 4,515,985, Cl. 562-472.000.

Kogame, Kunio; Tanba, Yoshihiro; and Makimura, Masaru, to Kuraray Co., Ltd. Entangled fibrous mat having good elasticity and methods for the production thereof. 4,515,854, Cl. 428-288.000.

Kohara, Kenichi: *See—*
Iwataki, Isao; Fujita, Kagari; Ishikawa, Hisao; Hosaka, Hideo; and Kohara, Kenichi, 4,515,729, Cl. 260-464.000.

Kohjin Co., Ltd.: *See—*
Miya, Toyofumi; Kobayashi, Yukiharu; and Yano, Masao, 4,515,943, Cl. 536-27.000.

Kohle, Ulrich; and Paffhausen, Hans, to Pelikan Aktiengesellschaft. Overstrike ribbon for print wheels. 4,515,489, Cl. 400-241.200.

Kohler Co.: *See—*
Block, Dale A., 4,515,037, Cl. 74-553.000.

Kohyama, Mitsuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing apparatus. 4,515,106, Cl. 118-651.000.

Koide, Masaru, to Nissan Motor Company, Limited. Vehicle suspension with lateral member. 4,515,391, Cl. 280-690.000.

Koizumi, Yukihasa: *See—*
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihasa, 4,516,134, Cl. 346-75.000.

Kojima, Hirotaka: *See—*
Adachi, Kiyoshi; Uehara, Masaru; Kitagawa, Hiroshi; Kojima, Hirotaka; and Sato, Masaaki, 4,514,965, Cl. 53-553.000.

Kokubo, Eiichi: *See—*
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Yato, Fumihiro; Kitayama, Seishi; and Kurematsu, Akira, 4,516,259, Cl. 381-36.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Utaka, Katsuyuki; Sakai, Kazuo; and Akiba, Shigeyuki, 4,516,243, Cl. 372-96.000.
Watanabe, Fumio; Mizuguchi, Yoshihiko; and Yamada, Matsuichi, 4,516,128, Cl. 343-761.000.

Kolbe, Klaus; Hellmann, Walter; Krajec, Otmar; Schikowsky, Hartmut; and Vetter, Heinz, to Rohm GmbH. Method of making a gastight multiple-walled plastic panel. 4,515,648, Cl. 156-196.000.

Kolinsky , Jiri : *See—*
Flegel, Martin; Krojidlo, Milan; Kolinsky , Jiri ; Masek, Karel; and Seifert, Jaroslav, 4,515,715, Cl. 260-112.50R.

Koller, James P.: *See—*
Durkee, David B.; Koller, James P.; and Wentzel, Robert M., 4,516,140, Cl. 346-140.00R.

Kollmar, Ulrich: *See—*
Bachmann, Heinrich; and Kollmar, Ulrich, 4,515,519, Cl. 414-680.000.

Komanduri, Ranga; Ettinger, Robert H.; Casey, Morton P., Jr.; and Reed, William R., Jr., to General Electric Company. Dynamically stiffened rotary tool system. 4,515,047, Cl. 82-1.00C.

Komathuzaki, Kiyomi: *See—*
Ito, Tosikazu; Komathuzaki, Kiyomi; Chonan, Kenichi; and Horibe, Kiyoshi, 4,515,066, Cl. 91-454.000.

Komatsu, Shigeru; and Inoue, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having a substrate covered with a high impurity concentration first polycrystalline layer and then a lower impurity concentration second polycrystalline layer. 4,516,147, Cl. 357-59.000.

Komeyama, Yoshihiro; and Taniguchi, Motoya, to Hitachi, Ltd. X-Ray lithographic apparatus. 4,516,254, Cl. 378-34.000.

Kompis, Ivan; Rey-Bellet, Gerald; and Zanetti, Guido, to Hoffmann-La Roche Inc. 2,4-Diamino-5-(4-amino and 4-dimethylamino-3,5-dimethoxy benzyl)pyrimidines. 4,515,948, Cl. 544-325.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Ohnuki, Mitsuo, 4,515,438, Cl. 350-255.000.
Sawada, Kiyoshi; Goto, Satoshi; Kinoshita, Akira; and Sasaki, Osamu, 4,515,881, Cl. 430-58.000.

Konstantin, Anatole E. Shrink banding machine for use with thin film. 4,514,966, Cl. 53-585.000.

Koos, William M., Jr., to Burroughs Corporation. Digital implementation of toner concentration sensing apparatus. 4,515,292, Cl. 222-52.000.

Koppl, Franz: *See—*
Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Muhlhofer, Ernst; and Schwab, Michael, 4,515,762, Cl. 423-337.000.

Korach, Malcolm, to PPG Industries, Inc. Electro organic method. 4,515,664, Cl. 204-62.000.

Korba, James M.: *See—*
Wallace, David R.; Korba, James M.; Matson, James E.; and Lynnworth, Lawrence C., 4,515,021, Cl. 73-861.270.

Korpijaakko, Pekka, to Willette Corporation. Method for making ambidirectional pressed ceramic slip-on support for a towel bar. 4,515,741, Cl. 264-62.000.

Korytko, Myron I., to EFCO, Inc. Closed loop hydraulic/mechanical leveling system. 4,515,551, Cl. 425-406.000.

Koshino, Yutaka: *See—*
Ajima, Takashi; Ohshima, Jiro; and Koshino, Yutaka, 4,515,642, Cl. 148-1.500.

Kosikowski, Frank V., to Cornell Research Foundation, Inc. Low sodium chloride ripened rennet cheeses by ultrafiltration. 4,515,815, Cl. 426-40.000.

Kosson, Robert L.: *See—*
Alario, Joseph P.; Brown, Richard F.; and Kosson, Robert L., 4,515,207, Cl. 165-1.000.

Kosugi, Takumi: *See—*
Uda, Junji; Yamamoto, Tsuneo; and Kosugi, Takumi, 4,515,915, Cl. 524-87.000.

Koszi, Louis A.: *See—*
Dixon, Richard W.; Joyce, William B.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,514,896, Cl. 29-576.00B.

Kotani, Shozo: *See—*
Yokogawa, Kanae; Kotani, Shozo; Kawata, Shigeo; and Takase, Yoshiyuki, 4,515,891, Cl. 435-69.000.

Kotilge, Jorg: *See—*
Dietl, Josef; and Kotilge, Jorg, 4,515,600, Cl. 23-293.00R.

Kotobuki Engineering & Mfg Company, Ltd.: *See—*
Kawaguchi, Mitsuru, 4,515,316, Cl. 241-5.000.

Kouichi, Ryujiro: *See—*
Sawano, Kiyohito; Kouichi, Ryujiro; Oota, Hideaki; Takano, Masashi; and Moroe, Michio, 4,515,909, Cl. 523-102.000.

Kovacs, Steve A., to Supreme Casting & Tooling. Blow molded article. 4,515,842, Cl. 428-36.000.

Kovar, Robert F.: *See—*
Leunig, Carl V.; and Kovar, Robert F., 4,515,848, Cl. 428-172.000.

Kowa Company, Ltd.: *See—*
Iwasaki, Akio; Deushi, Takeo; Watanabe, Isamu; and Mori, Toshihito, 4,515,942, Cl. 536-16.800.

Kowalski, Anthony M.: *See—*
Masak, Raymond J.; and Kowalski, Anthony M., 4,516,126, Cl. 343-383.000.

Kozuka, Michihiro; and Tonokura, Masayuki, to Tomy Kogyo Co., Inc. Moving toy capable of being non-permanently assembled. 4,515,571, Cl. 446-90.000.

Kraig, Leon; and Langenfeld, Mathew, to General Mills, Inc. Hollow, puffed fruit products and methods of preparation. 4,515,822, Cl. 426-445.000.

Krajec, Otmar: *See—*
Kolbe, Klaus; Hellmann, Walter; Krajec, Otmar; Schikowsky, Hartmut; and Vetter, Heinz, 4,515,648, Cl. 156-196.000.

Kramer, Edward T. Direction altering device. 4,515,244, Cl. 182-230.000.

Krantz, Gary B.: *See—*
Taylor, Charles E.; Gattiker, Anton; and Krantz, Gary B., 4,515,468, Cl. 355-27.000.

Krasselt, Manfred M.: *See—*
Apontoweil, Peter; and Krasselt, Manfred M., 4,515,777, Cl. 424-89.000.

Krasser, Fritz; and Kinner, Josef, to Ellenberger & Poensgen GmbH. Overcurrent protection switch. 4,516,098, Cl. 335-35.000.

Krasznai, Charles Z.: *See—*
Jeffress, Ronald E.; Wanat, David J.; and Krasznai, Charles Z., 4,516,011, Cl. 219-222.000.

Kreimes, Norbert: *See—*
Stumpfl, Werner; Bettinger, Gunter; Engel, Friedrich; Fitterer, Horst; Kreimes, Norbert; Pfefferkorn, Dietmar; Schaffer, Norbert; and Schmidts, Kurt, 4,515,331, Cl. 242-199.000.

Kreissler, Helmut: *See—*
Gehrung, Manfred; Schoettle, Klaus; Kreissler, Helmut; Rudolf, Peter; Hack, Joachim; and Anslinger, Friedrich, 4,514,937, Cl. 51-281.0SF.

Krekacs, Sandor: *See—*
Varga, Laszlo ; Krekacs, Sandor; Latorcai, Janos; Palfi, Zoltan; and Fledrich, Istvan, 4,514,911, Cl. 34-22.000.

Kreuter, Peter: *See—*
Pischinger, Franz; and Kreuter, Peter, 4,515,343, Cl. 251-48.000.

Kriebel, Manfred: *See—*
Eisenlohr, Karl-Heinz; Gaensslen, Hans; Kriebel, Manfred; and Tanz, Heiner, 4,515,604, Cl. 48-197.00R.

Krieg, Herman C., Jr., to United States of America, National Aeronautics and Space Administration. Moisture content and gas sampling device. 4,515,751, Cl. 422-86.000.

Krieger, Detlef: *See—*
Muller, Rudolf; Radeklau, Hans-Jurgen; Dofke, Harald; and Krieger, Detlef, 4,515,483, Cl. 366-303.000.

Krinock, Jerome V., to Michigan Consolidated Gas Company. Automatic equalization for a simulcast communication system. 4,516,269, Cl. 455-51.000.

Krishnai, Sivara: *See—*
Nouvertne, Werner; Serini, Volker; Neuray, Dieter; Binsack, Rudolf; Gehrke, Hans-Georg; Rempel, Dieter; and Krishnai, Sivara, 4,515,918, Cl. 524-504.000.

Krishnan, Sivaram: *See—*
Baron, Arthur L.; and Krishnan, Sivaram, 4,515,937, Cl. 528-204.000.

Kroh, Horst F. M.: *See—*
Dietz, Peter; Muller, Norbert W.; and Kroh, Horst F. M., 4,515,049, Cl. 82-36.00R.

Krojidlo, Milan: *See—*
Flegel, Martin; Krojidlo, Milan; Kolinsky , Jiri ; Masek, Karel; and Seifert, Jaroslav, 4,515,715, Cl. 260-112.50R.

KRONES AG Hermann Kronseder Maschinenfabrik: *See—*
Patzwahl, Hans-Jurgen, 4,514,953, Cl. 53-52.000.

Krug, Geoffrey P.: *See—*
Platek, Gary F.; and Krug, Geoffrey P., 4,515,672, Cl. 204-269.000.

Kruger, Hans-Rudolf; Arndt, Friedrich; and Rusch, Reinhard, to Schering Aktiengesellschaft. 1,2,3-Thiadiazole-5-yl-urea derivatives, agents containing these compounds with plant growth regulating and defoliating activity. 4,515,619, Cl. 71-90.000.

Krugh, Michael E., to Marathon Oil Company. Internal casing wiper for an oil field well bore hole. 4,515,212, Cl. 166-99.000.

Krull, Donald K.; and Naimpally, Saiprasad V., to RCA Corporation. Composite video signal processing apparatus providing amplitude equalization. 4,516,153, Cl. 358-31.000.

Krummnack, Friedrich: *See—*
Trumper, Thomas; Schoop, Gunther-Dietmar; Borgschulte, Fritz; and Krummnack, Friedrich, 4,515,410, Cl. 299-43.000.

Kubens, Rolf: *See—*
Kleiner, Frank; Kubens, Rolf; Reese, Eckart; and Wank, Joachim, 4,515,925, Cl. 525-439.000.

Kubota, Hitoshi, to Nissan Motor Company, Limited. Reservoir tank structure for master cylinder. 4,514,984, Cl. 60-585.000.

Kuczkowski, Joseph A.: *See—*
Wideman, Lawson G.; and Kuczkowski, Joseph A., 4,515,713, Cl. 260-106.000.

Kudo, Yoshiaki: *See—*
Mori, Shigeru; Kudo, Yoshiaki; and Kuwata, Satoshi, 4,515,702, Cl. 252-49.600.

Kuehnle, Manfred R.; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., to Coulter Systems Corporation. Optical mass memory system using electrophotography. 4,515,879, Cl. 430-31.000.

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Kuipers, Geert: *See—*
Blatt, Georg; van den Boom, Johannes; Kuipers, Geert; and Hollerweger, Heinz, 4,515,239, Cl. 181-290.000.

Kukla, Reiner: *See—*
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Kume, Hiroshi; and Tan, Yoichi, to Fuji Xerox Co., Ltd. Time division digital signal transmission system with block packing. 4,516,240, Cl. 370-85.000.

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Katabe, Kenichi; and Nishimura, Takeo, 4,515,852, Cl. 428-246.000.
Kogame, Kunio; Tanba, Yoshihiro; and Makimura, Masaru, 4,515,854, Cl. 428-288.000.
Omura, Ikuo; and Yamauchi, Junichi, 4,515,930, Cl. 526-276.000.

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Kawai, Yoshio; and Kitagawa, Kiyoshi, 4,515,676, Cl. 204-299.00R.
Sakurai, Yoshifumi; and Numata, Takuhisa, 4,516,222, Cl. 365-32.000.

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Yato, Fumihiro; Kitayama, Seishi; and Kurematsu, Akira, 4,516,259, Cl. 381-36.000.

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Nakagawa, Shiro; and Kuroiwa, Akihiko, 4,516,234, Cl. 369-109.000.

Kurrasch, Andrew J., to Herman Miller, Inc. Height adjustable table. 4,515,087, Cl. 108-147.000.

Kurten, Hans W.: *See—*
Baier, Heinz; Kurten, Hans W.; and Waschulewski, Hans-Georg, 4,515,027, Cl. 74-87.000.

Kury, John A., to Port-A-Boat, Inc. Combination boat and trailer assembly with integrated retractable trailer wheel structure. 4,515,102, Cl. 114-344.000.

Kurz, Gerhard. Device for automatically controlling the suction power of a vacuum cleaner. 4,514,874, Cl. 15-319.000.

Kuster & Co. GmbH: *See—*
Kuster, Klaus, 4,515,035, Cl. 74-501.00R.

Kuster, Klaus, to Kuster & Co. GmbH. Curved cable support member for bowden lifters. 4,515,035, Cl. 74-501.00R.

Kut-Kwick Corporation: *See—*
Torras, Robert M., 4,515,337, Cl. 248-371.000.
Torras, Robert M., 4,515,392, Cl. 280-755.000.

Kuwana, Kazutaka: *See—*
Inden, Masahiro; and Kuwana, Kazutaka, 4,515,345, Cl. 251-141.000.

Kuwata, Masayoshi, to General Electric Company. Method for fluidized particle tray heat exchange. 4,515,205, Cl. 165-1.000.

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Kwasnik, Hans-Jurgen; Piduch, Hans-Gunter; and Bruske, Heinz-Dieter, to C. Otto & Comp. G.m.b.H. Apparatus for removing charging hole covers and for cleaning sealing surfaces in a coke oven. 4,515,660, Cl. 202-241.000.

Kwiecinski, Alfred; and Yauger, Jon A., to Hamilton Sorter Company, Inc. Adjustable word processor work station. 4,515,086, Cl. 108-96.000.

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Savonjousi, Aslak, 4,515,318, Cl. 241-28.000.

Labonville, Emilien. Means for detachably connecting a chain link to a skidder ring. 4,515,198, Cl. 152-223.000.

LaChance, Paul. Movable hand railing and tray for ladders. 4,515,242, Cl. 182-106.000.

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Pellico, Michael A., 4,515,913, Cl. 523-109.000.

Lacroix, Guy: *See—*
Debourge, Jean-Claude; and Lacroix, Guy, 4,515,807, Cl. 514-513.000.

La Fiandra, Carlo; and Mumola, Peter B., to Perkin-Elmer Corporation, The. Actuator. 4,516,062, Cl. 318-676.000.

LaFrance Corporation: *See—*
Peroni, Peter A., 4,514,877, Cl. 16-111.00R.

Lamb-Weston, Inc.: *See—*
Shroyer, David, 4,514,959, Cl. 53-428.000.

Lampe, Guy W.: *See—*
Molitor, Edwin A.; Crain, Edward; and Lampe, Guy W., 4,515,581, Cl. 493-183.000.

Lancaster, Patrick R., III: *See—*
Mouser, Curtis A.; Roberts, Mark G.; Haas, Daniel R.; and Lancaster, Patrick R., III, 4,514,955, Cl. 53-64.000.

Landers, Samuel P.: *See—*
Kaniecki, Michael; Landers, Samuel P.; and Botzman, Thomas J., 4,515,199, Cl. 152-353.00R.

Landrum, Ralph A., Jr.: *See—*
Goodloe, Kent J.; and Landrum, Ralph A., Jr., 4,516,230, Cl. 367-190.000.

Landry, James D.: *See—*
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Lang, Roland; and Karwat, Heinz, to Linde Aktiengesellschaft. Non-precipitating regulation of ammonia content in sour gas solvent scrubbing systems. 4,515,760, Cl. 423-220.000.

Lang, Stanley A., Jr.; and Murdock, Keith C., to American Cyanamid Company. Metal chelates of anthracene-9,10-bis-carbonylhydrazones. 4,515,954, Cl. 548-109.000.

Lang, Winfried: *See—*
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Lange, Hans: *See—*
Klose, Sigmar; Stahler, Fritz; Lange, Hans; and Kleemann, Wolfgang, 4,515,889, Cl. 435-4.000.

Langen, Marinus J. M., to H. J. Langen & Sons Limited. Bag loading machine. 4,514,957, Cl. 53-252.000.

Langen, Marinus J. M., to H. J. Langen & Sons Limited. Packaging machines. 4,514,964, Cl. 53-540.000.

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Kraig, Leon; and Langenfeld, Mathew, 4,515,822, Cl. 426-445.000.

Langer, Salomon Z.: *See—*
Cavero, Icilio; Langer, Salomon Z.; and York, Billie M., Jr., 4,515,800, Cl. 514-392.000.

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Hall, Douglas J.; Langley, Robert F.; and Thomas, Edwin L., 4,515,878, Cl. 430-5.000.

Lanier Business Products, Inc.: *See—*
Bolick, Fred C., Jr.; and Plunkett, Luther C., Jr., 4,515,995, Cl. 179-6.130.

Lantech, Inc.: *See—*
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Latham, Philip A.: *See—*
Kaye, Arthur; Carr, Brian; and Latham, Philip A., 4,516,063, Cl. 318-685.000.

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Churma, Theodore; Latimer, Elwood D., Jr.; and Vicik, Stephen J., 4,515,745, Cl. 264-211.000.

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Varga, Laszlo; Krekacs, Sandor; Latorcai, Janos; Palfi, Zoltan; and Fledrich, Istvan, 4,514,911, Cl. 34-22.000.

LaTulip, Randy J.: *See—*
Swearingen, Loren L.; and LaTulip, Randy J., 4,515,938, Cl. 528-252.000.

Laurel Bank Machine Co., Ltd.: *See—*
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.

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Lavene, Bernard, to Electronic Concepts, Inc. Outer wrapping and planar terminations for a metallized wound capacitor and method therefor. 4,516,187, Cl. 361-309.000.

Lavielle, Christian. Device for retaining in side-by-side relationship flexible tying means such as shoelaces. 4,514,882, Cl. 24-16.0PB.

Lawless, William N.; Cross, Leslie E.; and Steyert, William A. Miniature solid-state gas compressor. 4,515,534, Cl. 417-322.000.

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Hardy, Patrick; Cantagrel, Michel; and Guichard, Serge, 4,516,186, Cl. 361-306.000.
Le Metal Deploye: *See—*
Buguet, M. Maurice; and Deruelle, M. Patrick, 4,516,108, Cl. 338-319.000.
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Chandler, Donald E.; Chisholm, William M.; and Lechner, Ralph T., 4,515,354, Cl. 269-15.000.
Lechtken, Peter; Mueller, Gerhard; and Schmieder, Klaus, to BASF Aktiengesellschaft. Aminoreductones. 4,515,982, Cl. 560-125.000.
LeDevehat, Eugene R., to FMC Corporation. Pipe coupling with valve closure safety system. 4,515,182, Cl. 137-614.060.
Lee, Chee M.: *See—*
Pugh, Stuart; Smith, Douglas G.; Lee, Chee M.; Parr, Leslie R.; Birkett, John N.; Stibbs, Richard G.; and Tai, Tet C., 4,515,333, Cl. 248-122.000.
Lee, Ching W., to GTE Laboratories Incorporated. Acoustic surface wave device. 4,516,094, Cl. 333-194.000.
Lee, Ching W., to GTE Laboratories Incorporated. Surface acoustic wave device. 4,516,095, Cl. 333-194.000.
Lee, Do I.: *See—*
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Lee, Harry W., Jr.; and Wallace, Joseph W., to Reynolds Metals Company. Can body bottom configuration. 4,515,284, Cl. 220-70.000.
Lee, Minyoung: *See—*
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,515,746, Cl. 264-332.000.
Lee, Patrick S., to Ampex Corporation. Cylinder crossing detection circuit for disc drive or the like. 4,516,178, Cl. 360-78.000.
Lee, Richard J. Turret press for reloading rifle and pistol cartridges. 4,515,063, Cl. 86-27.000.
Lee, Steven N., to ASQ Boats, Inc. Contiguous wafer boat. 4,515,104, Cl. 118-500.000.
Lees, Brian: *See—*
Davidson, Lewis; Lees, Brian; and Lytra, Eric K., 4,515,077, Cl. 101-127.000.
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Crum, Michael A., 4,515,407, Cl. 297-429.000.
Leiner, Dennis C.: *See—*
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Leland Stanford Jr. Univeristy, Board of Trustees of: *See—*
Boudart, Michel; Oyama, Shigeo T.; and Volpe, Leo, 4,515,763, Cl. 423-409.000.
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Barth, Phillip W., 4,516,148, Cl. 357-68.000.
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Leonard, Myer S. Method and apparatus for indexing the condyle position during sagittal ramus split surgery. 4,515,154, Cl. 128-92.0EB.
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Deckers, Albert T.; and Leppink, Arie, 4,515,470, Cl. 355-105.000.
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., to Sterling Drug Inc. 3-Amino-5-(hydroxy- and/or aminophenyl)-6-(lower-alkyl)-2(1H)-pyridinones and cardiotonic use thereof. 4,515,797, Cl. 514-349.000.
Lestraden, Jacobus W., to Schulte & Lestraden B.V. Cell. 4,514,929, Cl. 47-17.000.
Leth-Sorensen, Thomas. Holder with a plurality of spring clips for suspension of sheet material. 4,515,277, Cl. 211-45.000.
Leunig, Carl V.; and Kovar, Robert F., to Gates Formed Fibre Products Inc. Materials and methods for making resin-rigidified articles. 4,515,848, Cl. 428-172.000.
Levengood, James L., to United Technologies Corporation. Coolable airfoil for a rotary machine. 4,515,526, Cl. 416-96.00R.
Lever Brothers Company: *See—*
Haq, Zia, 4,515,703, Cl. 252-92.000.
Moran, David P. J.; and Sharp, David G., 4,515,825, Cl. 426-603.000.
Leviandier, Michel: *See—*
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Kieser, Jorg; Kukla, Reiner; and Deppisch, Gerd, 4,515,675, Cl. 204-298.000.
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Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,515,987, Cl. 568-433.000.
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Huber, Hans P.; and Weber, Jochen, 4,516,010, Cl. 219-121.0LJ.
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Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,516,199, Cl. 364-200.000.
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Chiu, Te-Long; and Lien, Jih-Chang, 4,514,897, Cl. 29-578.000.
Lin, Chin-Lung. Exercise tricycle. 4,515,362, Cl. 272-114.000.
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Heyl, Walter, 4,515,067, Cl. 91-506.000.
Lang, Roland; and Karwat, Heinz, 4,515,760, Cl. 423-220.000.
Wernicke, Hans J.; and Zimmerman, Heinz, 4,515,678, Cl. 208-10.000.
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Lindgren, Carl E., to ASEA Aktiebolag. Detection of light-producing events. 4,516,022, Cl. 250-227.000.
Lindquist, Bjorn K. V.; and Petersson, Stig A., to Boliden Aktiebolag. Method for producing blister copper. 4,515,631, Cl. 75-73.000.
Ling, Chi-Fei, to American Cyanamid Company. Process for sizing textile materials. 4,515,855, Cl. 428-290.000.
Linn, Bruce O.; and Lusi, Aino, to Merck & Co., Inc. 4-Amino-4-dehydroxy derivatives of efrotomycin and related compounds. 4,515,783, Cl. 514-27.000.
Liss, Gote, to ASEA Aktiebolag. Control system for DC power transmission. 4,516,198, Cl. 363-35.000.
Little, Gordon R.: *See—*
Ballard, Paul T.; and Little, Gordon R., 4,515,478, Cl. 356-345.000.
Litton Systems, Inc.: *See—*
Ringdahl, Mark G.; Raymond, Lambert L.; and Scherer, Richard J., 4,516,007, Cl. 219-10.55D.
Lochow, Charles F., Jr.: *See—*
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Bradley, Robert E.; and Keithler, William R., 4,515,919, Cl. 524-591.000.
Sullivan, Paul E.; and Peppel, George W., 4,515,399, Cl. 285-95.000.
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Carney, Thomas E.; Champion, Allan R.; and Logullo, Francis M., Sr., 4,515,636, Cl. 106-90.000.
Loh, William, to Chevron Research Company. 5-Deoxy-3-O-thienylmethyl or furylmethyl-1,2-O-alkylidene-alpha-D-xylofuranose herbicide derivatives. 4,515,618, Cl. 71-88.000.
Lohn, Gerd, to Kaltenbach & Voigt GmbH & Co. Dental handpiece 4,515,564, Cl. 433-126.000.
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Baier, Heinz; Kurten, Hans W.; and Waschulewski, Hans-Georg, 4,515,027, Cl. 74-87.000.
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Love, Robert P., to General Electric Company. Self-aligned power MOSFET with integral source-base short and methods of making. 4,516,143, Cl. 357-23.400.
Lovelace, Harold, to International Paper Company. Bottom sealing tab prebreaking apparatus. 4,515,580, Cl. 493-183.000.
Loy, Robert E.; Phillips, Dale R.; and Willis, Paul E., to Dresser Industries, Inc. Stabilizing and isolation system for a vehicle cab. 4,515,234, Cl. 180-89.120.
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Eden, Dayton D., 4,515,471, Cl. 356-5.000.
Welch, Albert B., 4,515,472, Cl. 356-5.000.
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Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., 4,515,156, Cl. 128-202.260.
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Luthi, Oscar, to Ingersoll-Rand Company. Fiberglass-reinforced solid plastic drum. 4,515,693, Cl. 210-402.000.
Lutts, William P.: *See—*
Shannon, Harry D.; and Lutts, William P., 4,516,124, Cl. 340-960.000.
Lutzens, William W., to Union Oil Company of California. Convergence extensometer for measuring mine roof subsidence. 4,514,905, Cl. 33-125.00B.
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Luz International Ltd.: *See—*
Bodenheimer, Joseph S.; and Eisenberg, Naphtali, 4,516,018, Cl. 250-203.00R.
Lynch, John: *See—*
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Mabb, Kenneth G., to Sodastream Limited. Apparatus for aerating liquids. 4,514,994, Cl. 62-389.000.
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Snowdon, Brian, 4,515,503, Cl. 406-11.000.
MacDonald, Bruce E.; Galloway, Geoffrey; and Kakuda, Yukio, to CSP Foods Ltd. Process for preparing sunflower butter spread from pretreated sunflower seeds. 4,515,818, Cl. 426-268.000.
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Ito, Takeshi, 4,515,325, Cl. 242-84.51R.
Machon, William P., Sr. Device for elevating closet bowl. 4,515,398, Cl. 285-59.000.
MacKenzie, Burton T., to TRW Inc. Low profile submersible electrical cable. 4,515,993, Cl. 174-102.00R.
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Heathcoat, Michael J.; Jackson, Douglas H.; Jowitt, Frederick W.; Madley, Jack R.; and Stuart, Ian C. E., 4,515,677, Cl. 204-300.0EC.
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Diepeveen, Neal, 4,516,159, Cl. 358-293.000.
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West, David E., 4,516,162, Cl. 360-25.000.
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Kuhlman, George A., 4,515,015, Cl. 73-304.00C.
Maguire, Edward D. Portable building structure. 4,514,938, Cl. 52-79.400.
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Maki, Masao; Kaneko, Yasunori; and Kobayashi, Ikuo, to Matsushita Electric Industrial Co., Ltd. Coated surfaces capable of decomposing oils. 4,515,862, Cl. 428-450.000.
Maki, William. Radio-controlled skyline carriage. 4,515,281, Cl. 212-76.000.
Makimura, Masaru: *See*—
Kogame, Kunio; Tanba, Yoshihiro; and Makimura, Masaru, 4,515,854, Cl. 428-288.000.
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Manabe, Nobuyuki; and Goto, Takahiro, to Taiho Industries Co. Ltd.; and O.P.E. Co. Ltd. Apparatus for disposal of sludge in a floating roof type oil tank. 4,515,312, Cl. 239-227.000.
Manderino, George L.; and Suarez, Adoracion F., to Abbott Laboratories. Immunoassay of terminal deoxynucleotidyl transferase. 4,515,890, Cl. 435-7.000.
Manderla, Henry J., to Anthes Equipment Limited. Shoring system. 4,514,940, Cl. 52-126.100.
Mangeym, Gennady: *See*—
Guzik, Nahum; and Mangeym, Gennady, 4,516,060, Cl. 318-341.000.
Manolis, John. Crankcase emissions device. 4,515,137, Cl. 123-572.000.
Marathon Oil Company: *See*—
Krugh, Michael E., 4,515,212, Cl. 166-99.000.
Wener, Kenneth R.; and Tinkle, Anthony R., 4,516,227, Cl. 367-15.000.
Margolin, Mark; Grois, Igor; Herdeg, Peter K.; and Nijman, John P., to Allied Corporation. Fiber optic connector. 4,515,434, Cl. 350-96.210.
Margolis, Anatoly E.: *See*—
Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., 4,515,156, Cl. 128-202.260.
Marinak, Michael J.; and Simonson, John L., to Kalama Chemical, Inc. Production of polychlorinated pyridine mixtures by liquid phase chlorination of pyridine or pyridine hydrochloride. 4,515,953, Cl. 546-345.000.
Mariol, James F. Toy kitchen play center. 4,515,359, Cl. 272-1.00R.
Mariol, James F. Sandbox with play deck cover. 4,515,360, Cl. 272-1.00A.
Marker, Franklin, III. Computer printer stand with multiple paper web guide slots. 4,515,490, Cl. 400-613.200.
Marker International: *See*—
Emert, Anton; Knabel, Walter; and Richert, Manfred, 4,515,388, Cl. 280-605.000.
Markov, Vladimir A.; Filatov, Vladimir N.; Kernasovsky, Ilya S.; and Gorina, Ljudmila V., to Vsesojuzny Nauchno-Issledovatelsky Institut Textilno-Galantereinoi Promyshlennosti. Device for damping impact load. 4,515,254, Cl. 188-371.000.
Marpoe, Gary R., Jr., to AMP Incorporated. Device for use in testing printed circuit board components. 4,516,072, Cl. 324-158.00F.
Marq Packaging Systems, Inc.: *See*—
Beckett, Joel M., 4,515,579, Cl. 493-1.000.
Dahlke, Douglas F., 4,516,210, Cl. 364-471.000.
Marritt, William A.: *See*—
Brazdil, James F., Jr.; Marritt, William A.; and Ward, Michael D., 4,515,732, Cl. 260-465.600.
Marshall, Charles R., to Dixon Industries Corporation. Double cup sealing member for double action piston pump. 4,515,378, Cl. 277-152.000.
Marshall and Williams Company: *See*—
Cavanagh, Kenneth M., 4,515,313, Cl. 239-455.000.
Marston Palmer Limited: *See*—
Hayfield, Peter C. S., 4,515,673, Cl. 204-290.00F.
Martellock, Arthur C.: *See*—
Field, John R.; Kocher, Haribhajan S.; and Martellock, Arthur C., 4,515,884, Cl. 430-99.000.
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, to Zyma SA. Crystal modifications of (+)-catechin and pharmaceutical preparations containing them. 4,515,804, Cl. 514-456.000.
Martin, Lawrence L.; and Setescak, Linda L., to Hoechst-Roussel Pharmaceuticals Inc. 6,11-Dihydro-11-oxo-dibenz-[b,e]oxepin derivatives. 4,515,946, Cl. 548-237.000.
Martin, Sylvia: *See*—
Strom, Alice M.; Herr, R. Wilbur; and Martin, Sylvia, 4,515,663, Cl. 204-44.200.
Martin, Tony E., to Moog Automotive, Inc. Service tool means for rack and pinion steering systems. 4,515,042, Cl. 81-55.000.
Masai, Tadahisa: *See*—
Azuhata, Shigeru; Arashi, Norio; Narato, Kiyoshi; Inada, Tooru; Souma, Kenichi; Ohtsuka, Keizou; Hishinuma, Yukio; and Masai, Tadahisa, 4,515,094, Cl. 110-347.000.
Masak, Raymond J.; and Kowalski, Anthony M., to Hazeltine Corporation. Adaptive array having an auxiliary channel notched pattern in the steered beam direction. 4,516,126, Cl. 343-383.000.
Mascellani, Giuseppe: *See*—
Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, 4,515,809, Cl. 514-533.000.
Maschinenfabrik Schweiter AG: *See*—
Slavik, Walter; and Rebsamen, Arthur, 4,515,320, Cl. 242-18.0DD.
Masek, Karel: *See*—
Flegel, Martin; Krojidlo, Milan; Kolinsky , Jiri ; Masek, Karel; and Seifert, Jaroslav, 4,515,715, Cl. 260-112.50R.
Maskingruppen 82 AB: *See*—
Johansson, Bengt, 4,514,952, Cl. 52-713.000.
Maslanka, William W., to Hercules Incorporated. Wet Strength resins. 4,515,657, Cl. 162-164.300.
Mason, Mark T.: *See*—
Morrill, David R.; Mason, Mark T.; and Green, Paul M., 4,516,023, Cl. 250-235.000.
Massachusetts General Hospital, The: *See*—
Castronovo, Frank P.; Strauss, Harry W.; and Potsaid, Majic S., 4,515,766, Cl. 424-1.100.
Massachusetts Institute of Technology: *See*—
Johnson, Leonard M., 4,515,430, Cl. 350-96.130.
Masuda, Isao; Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Ueno, Shoji, to Victor Company of Japan. Digital information signal recording system. 4,516,163, Cl. 360-32.000.
Masuda, Shunichi; Yagasaki, Toshiaki; and Kasuya, Yukio, to Canon Kabushiki Kaisha. Image forming apparatus. 4,515,458, Cl. 355-3.0SH.
Matheny, Perry D.: *See*—
Chasar, Dwight W.; and Matheny, Perry D., 4,515,733, Cl. 260-988.000.
Matson, James E.: *See*—
Wallace, David R.; Korba, James M.; Matson, James E.; and Lynnworth, Lawrence C., 4,515,021, Cl. 73-861.270.

Matsubayachi, Kynichi: *See*—
Boigegrain, Robert; Maffrand, Jean-Pierre; Suzuki, Norio; Matsubayachi, Kynichi; and Ashida, Shinichiro, 4,515,951, Cl. 546-114.000.

Matsui, Hisashi: *See*—
Kataoka, Takeshi; Aoki, Ryoichi; Matsui, Hisashi; and Matsumoto, Hiroshi, 4,515,024, Cl. 74-10.330.

Matsui, Kazuma: *See*—
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.

Matsui, Seiji: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,515,351, Cl. 266-177.000.

Matsui Shikiso Chemical Co. Ltd.: *See*—
Keino, Goro; Kitagawa, Yosuke; and Hayashi, Yoshimi, 4,515,849, Cl. 428-201.000.

Matsumoto, Hiroshi: *See*—
Kataoka, Takeshi; Aoki, Ryoichi; Matsui, Hisashi; and Matsumoto, Hiroshi, 4,515,024, Cl. 74-10.330.

Matsumoto, Ikuo, to Victor Company of Japan, Ltd. Magnetic recording media comprising titanium monoxide and carbon black powders in a magnetic recording layer. 4,515,856, Cl. 428-323.000.

Matsumoto, Katsuo: *See*—
Yamamoto, Katsuhiro; Matsumoto, Katsuo; and Okada, Yoshiyuki, 4,515,162, Cl. 128-640.000.

Matsumoto, Shigeru; Okabe, Yoshikatsu; and Kazama, Yasuhiro, to Japan Radio Company, Limited. Antenna element having non-feed conductive loop surrounding radiating element. 4,516,133, Cl. 343-819.000.

Matsumoto, Takashi: *See*—
Matsuzaki, Isokazu; Yamagiwa, Akira; Watanabe, Yutaka; Matsumoto, Takashi; and Yabe, Katsumi, 4,516,039, Cl. 307-455.000.

Matsuo, Shuitsu; Imanishi, Yasuhiro; Nagashima, Hideo; Watanabe, Masaharu; Usami, Toshiro; and Muraoka, Hisashi, to Toshiba Ceramics Co., Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for producing a silicon single crystal from a silicon melt. 4,515,755, Cl. 422-246.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Maki, Masao; Kaneko, Yasunori; and Kobayashi, Ikuo, 4,515,862, Cl. 428-450.000.
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,516,061, Cl. 318-561.000.

Matsushita, Nobuo; Furukawa, Tokinobu; Shintani, Tetsuo; Sumitani, Tomoaki; and Oda, Chikao, to Hitachi, Ltd. Polymerization rate detection method. 4,515,008, Cl. 73-53.000.

Matsuura, Masaaki; and Nakano, Yoshikatsu, to Honda Giken Kogyo Kabushiki Kaisha. Valve driving control apparatus in an internal combusiton engine. 4,515,121, Cl. 123-198.00F.

Matsuzaki, Isokazu; Yamagiwa, Akira; Watanabe, Yutaka; Matsumoto, Takashi; and Yabe, Katsumi, to Hitachi, Ltd. Logic circuit utilizing a current switch circuit having a non-threshold transfer characteristic. 4,516,039, Cl. 307-455.000.

Matsuzaki, Tadashi; and Sumi, Koji, to Mitsubishi Denki Kabushiki Kaishi. Overcurrent relay. 4,516,183, Cl. 361-71.000.

Matthew, Ian G.; Pammenter, Robert V.; and Kershaw, Mervyn G., to Electrolytic Zinc Company of Australasia Limited. Treatment of solutions to facilitate the removal of ferric iron therefrom. 4,515,696, Cl. 210-713.000.

Matusz, Arnold J.: *See*—
Dorsch, Robert; and Matusz, Arnold J., 4,515,073, Cl. 98-115.200.

Maurer, Alexander; and Staendeke, Horst, to Hoechst Aktiengesellschaft. Activated ammonium polyphosphate, a process for making it, and its use. 4,515,632, Cl. 106-18.160.

Maxemchuk, Nicholas F., to AT&T Bell Laboratories. System, apparatus and method for controlling a multiple access data communications system including variable length data packets and fixed length collision-free voice packets. 4,516,239, Cl. 370-85.000.

May, Adolf: *See*—
Billenstein, Siegfried; Hartung, Herbert; May, Adolf; and Bucking, Hans-Walter, 4,515,723, Cl. 260-404.500.

Mayama, Hidekiyo: *See*—
Kobayashi, Akio; Mizoguchi, Hitoshi; Ikeda, Hisatoshi; and Mayama, Hidekiyo, 4,516,006, Cl. 200-148.00A.

Mayer, Franz: *See*—
Janusch, Alois; and Mayer, Franz, 4,514,912, Cl. 34-37.000.

Mazda Motor Corporation: *See*—
Moriyama, Naomune; and Ohtani, Fumiyuki, 4,516,191, Cl. 362-65.000.

Mazziotti, Philip J., to Zeller Corporation, The. Universal joint seal with multiple lips. 4,515,574, Cl. 464-131.000.

Mazzola, Massimo; and Cipriani, Aldo, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Liquid foams of reinforced unsaturated polyester resins and process for making the same. 4,515,908, Cl. 521-182.000.

McCarthy, James P.; and Byler, Richard E., to Ford Motor Company. Solenoid operated pressure regulation. 4,515,176, Cl. 137-115.000.

McConaghy, Robert F., to Advanced Technology Laboratories, Inc. Oscillating ultrasound scanhead. 4,515,017, Cl. 73-618.000.

McCullough, Thomas W.; and Stevens, Bradley D., to Dow Chemical Company, The. Styrene polymer foam made with alpha-polyolefin additives. 4,515,907, Cl. 521-139.000.

McDermott, Arthur W., to Boeing Company, The. Coil assembly for hot melt induction heater apparatus. 4,516,104, Cl. 336-206.000.

McDevitt, Steven C.: *See*—
Tallman, William R.; McDevitt, Steven C.; and Delancey, Warren H., 4,515,145, Cl. 126-99.00A.

McDonald, Ray S.; Thompson, David L.; Rossing, Martin A.; and Hartlaub, Jerome T., to Medtronic, Inc. Digital cardiac pacemaker with rate limit means. 4,515,159, Cl. 128-419.0PG.

McDonald, William R.: *See*—
Anderson, Robert L.; and McDonald, William R., 4,515,132, Cl. 123-494.000.

McDonnell Douglas Corporation: *See*—
Arrazola, Ignacio M., 4,515,450, Cl. 353-5.000.

McEvilly, Thomas V. Post-processing of seismic parameter data based on valid seismic event determination. 4,516,206, Cl. 364-421.000.

McGean-Rohco, Inc.: *See*—
Zellner, Robert J., 4,515,765, Cl. 423-617.000.

McGlew, John J.; and McGlew, John J. B., Jr. Building structure and building panel and method of controlling appearance and lighting of a building. 4,515,150, Cl. 126-445.000.

McGlew, John J. B., Jr.: *See*—
McGlew, John J.; and McGlew, John J. B., Jr., 4,515,150, Cl. 126-445.000.

McGraw-Edison Company: *See*—
Comer, Philip L., 4,514,875, Cl. 15-349.000.

McInerney, Charles E.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,515,136, Cl. 123-564.000.

McKay, Stewart K. Securing assembly. 4,515,496, Cl. 403-388.000.

McKinney, Linda M.; and McKinney, Osborne K., to Dow Chemical Company, The. Polyurethane backed carpet formed with two catalysts. 4,515,846, Cl. 428-95.000.

McKinney, Osborne K.: *See*—
McKinney, Linda M.; and McKinney, Osborne K., 4,515,846, Cl. 428-95.000.

McLaughlin, William D., Jr., to Celanese Corporation. Cutter wheel for cutting continuous tow. 4,515,054, Cl. 83-663.000.

McMaster, Harold A.; McMaster, Robert G.; and McMaster, Ronald A., to Glasstech, Inc. Glass sheet quench including oppositely angled jets. 4,515,622, Cl. 65-351.000.

McMaster, Robert G.: *See*—
McMaster, Harold A.; McMaster, Robert G.; and McMaster, Ronald A., 4,515,622, Cl. 65-351.000.

McMaster, Ronald A.: *See*—
McMaster, Harold A.; McMaster, Robert G.; and McMaster, Ronald A., 4,515,622, Cl. 65-351.000.

McNeilly, David R.: *See*—
Simpson, Marc L.; and McNeilly, David R., 4,516,020, Cl. 250-214.00L.

McShane, Lawrence J., to Eli Lilly and Company. Azetidinone sulfinic acids from cephalosporin sulfones. 4,515,719, Cl. 260-239.00A.

Means, Thomas C.; and Emmerich, Kenneth C., to Fansteel Inc. Roof drill bit. 4,515,230, Cl. 175-410.000.

Mechtron International Corp.: *See*—
Brashears, David F.; and Mollick, Joseph T., 4,515,090, Cl. 110-264.000.

Meco Equipment Engineers, B.V.: *See*—
Piepers, Harry C.; and van Poele, Gerard J., 4,515,670, Cl. 204-199.000.

Medtronic, Inc.: *See*—
Keimel, John G., 4,515,160, Cl. 128-419.0PG.
McDonald, Ray S.; Thompson, David L.; Rossing, Martin A.; and Hartlaub, Jerome T., 4,515,159, Cl. 128-419.0PG.

Medwed, Emmerich, to Multivac Sepp Haggenmuller, KG. Molding apparatus provided with separable mold parts. 4,515,546, Cl. 425-195.000.

Meier, David P.: *See*—
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,516,199, Cl. 364-200.000.

Meigs, William; Guffey, David M.; and Brumfield, Donald E., to Disco Aluminum Products Co., Inc. Thermal break frame with load transfer member. 4,514,948, Cl. 52-397.000.

Meiners, Hans J.: *See*—
Fauss, Rudolf; Meiners, Hans J.; Rasshofer, Werner; and Meyborg, Holger, 4,515,923, Cl. 525-127.000.

Meininger, Fritz; Otten, Joachim W., deceased; by Otten, Ursula, heir; and by Rudolph nee Otten, Anna G., heir, to Hoechst Aktiengesellschaft. Process for dyeing and printing fiber materials containing hydroxy and/or carbonamide groups with reactive dye containing both vinyl sulphonyl and fluoro-triazinyl groups. 4,515,598, Cl. 8-549.000.

Melgaard, Hans L., to Despatch Industries, Inc. Fiber treatment oven. 4,515,561, Cl. 432-136.000.

Melillo, Anthony; and Gabriele, Louis, to Codella, Michael, a part interest. Exercising appliance. 4,515,361, Cl. 272-93.000.

Mellgren, Kenth: *See*—
Ryberg, Bertil; and Mellgren, Kenth, 4,516,000, Cl. 200-44.000.

Melton, David T.: *See*—
Pendergrass, John E.; and Melton, David T., 4,515,594, Cl. 604-384.000.

Melton, Lynn A., to United Technologies Corporation. Fluorescent additives for the determination of condensed and vapor phases in multiphase systems. 4,515,896, Cl. 436-2.000.

Memeger, Wesley, Jr., to Du Pont de Nemours, E. I., and Company. Low density nonwoven sheets. 4,515,656, Cl. 162-101.000.

Memory Metals, Inc.: *See*—
Rogen, Neil E.; and Adnyana, Dewa N., 4,515,213, Cl. 166-123.000.

Menchetti, Robert J.; and Sauer, Gale E., to Donn Incorporated. Window insulating system. 4,514,945, Cl. 52-202.000.
Mendenhall, Douglas W.; and Li, Ping, to Abbott Laboratories. Powder syringe mixing system. 4,515,586, Cl. 604-87.000.
Mengel, Hans-Eckhard; and Munzel, Hermann, to Norton Christensen, Inc. Tooth design to avoid shearing stresses. 4,515,226, Cl. 175-57.000.
Mercier, Rene, to CEM Compagnie Electro-Mecanique. Continuous current electric machine with cylindrical air gap and permanent magnet pole piece. 4,516,046, Cl. 310-154.000.
Merck & Co., Inc.: *See*—
Linn, Bruce O.; and Lusi, Aino, 4,515,783, Cl. 514-27.000.
Yang, Shu S.; Beattie, Thomas R.; Durette, Philippe L.; Gallagher, Timothy F.; and Shen, Tsung-Ying, 4,515,722, Cl. 260-403.000.
Mermelstein, Marc D., to Geo-Centers, Inc. Photoelastic stress sensor signal processor. 4,515,473, Cl. 356-33.000.
Merritt, Carleton G.; Wingerd, Winston H.; and Keller, David J., to Borden, Inc. Encapsulated flavorant material, method for its preparation, and food and other compositions incorporating same. 4,515,769, Cl. 424-49.000.
Merten, Rudolf: *See*—
Zecher, Wilfried; and Merten, Rudolf, 4,515,974, Cl. 549-372.000.
Messenger, Edward T.: *See*—
Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., 4,515,704, Cl. 252-135.000.
Messer Griesheim GmbH: *See*—
Bohm, Gottfried, 4,515,645, Cl. 148-16.000.
Metal Box Limited: *See*—
Heathcoat, Michael J.; Jackson, Douglas H.; Jowitt, Frederick W.; Madley, Jack R.; and Stuart, Ian C. E., 4,515,677, Cl. 204-300.0EC.
Metallgesellschaft Aktiengesellschaft: *See*—
Eisenlohr, Karl-Heinz; Gaensslen, Hans; Kriebel, Manfred; and Tanz, Heiner, 4,515,604, Cl. 48-197.00R.
Meteor AG: *See*—
Arnold, Ernst, 4,516,103, Cl. 336-65.000.
Metzger, Karl G.; Schrock, Wilfried; Habich, Dieter; Naab, Paul; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. β-Lactam antibiotics. 4,515,789, Cl. 514-196.000.
Meunier, Paul-Louis: *See*—
Hartemann, Pierre; Meunier, Paul-Louis; and Jacobelli, Alain, 4,515,016, Cl. 73-517.00R.
Meyborg, Holger: *See*—
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Meyer, Danny S.: *See*—
Hollister, F. Harold; and Meyer, Danny S., 4,515,174, Cl. 137-72.000.
Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,515,682, Cl. 208-111.000.
Chen, Nai Y.; and Miale, Joseph N., 4,515,892, Cl. 435-161.000.
Michaelis, Theodore D., to RCA Corporation. Optical disc system having momentum compensation. 4,516,231, Cl. 369-44.000.
Michigan Consolidated Gas Company: *See*—
Krinock, Jerome V., 4,516,269, Cl. 455-51.000.
Micro Automation, Inc.: *See*—
Miller, William I.; and Reimiller, Robert D., 4,515,480, Cl. 356-400.000.
Micronix Partners: *See*—
Novak, W. Thomas, 4,516,253, Cl. 378-034.000.
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Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Sugai, Kazuyoshi, to Mikoshiba, Nobuo; and Tsubouchi, Kazuo. Multi-layer acoustic surface wave device having minimal delay time temperature coefficient. 4,516,049, Cl. 310-313.00A.
Mikuni Kohyo Co., Inc.: *See*—
Tominari, Noboru, 4,516,184, Cl. 361-152.000.
Milkowski, Wolfgang: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,515,944, Cl. 544-91.000.
Miller, Lalan G.: *See*—
Roberts, Richard D.; Franz, James H., Jr.; Hoffman, Lester J.; and Miller, Lalan G., 4,516,059, Cl. 318-301.000.
Miller, Lowell A., to Scientific Laboratories, Inc. Tube crimping device. 4,515,550, Cl. 425-392.000.
Miller, Richard C.: *See*—
Dixon, Richard W.; Joyce, William B.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,514,896, Cl. 29-576.00B.
Miller, Richard D., to RCA Corporation. Linear ramp voltage generator circuit. 4,516,036, Cl. 307-228.000.
Miller, William I.; and Reimiller, Robert D., to Micro Automation, Inc. Pattern alignment system and method. 4,515,480, Cl. 356-400.000.
Millerd, Donald L.: *See*—
Hemmerich, Karl J.; Millerd, Donald L.; and Semedo, Anthony B., 4,515,591, Cl. 604-152.000.
Millikan, Robert C.: *See*—
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Milliken Research Corporation: *See*—
Ashley, Fred C., 4,515,327, Cl. 242-118.300.
Rekers, John W., 4,515,666, Cl. 204-159.200.
Mills, George A.; and Richert, Gerald R., to Pennwalt Corporation. Apparatus and method for processing fruit and the like. 4,515,275, Cl. 209-558.000.
Minami, Hitoshi, to Pentel Kabushiki Kaisha. Multicolor printer. 4,515,487, Cl. 400-121.000.
Minami, Setsuo: *See*—
Takahashi, Sadatoshi; Tsuji, Sadahiko; Tajima, Akira; Asano, Toshiaki; and Minami, Setsuo, 4,515,446, Cl. 350-427.000.
Miner, Thomas G.: *See*—
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Minigrip, Inc.: *See*—
Ausnit, Steven, 4,514,962, Cl. 53-457.000.
Minnebraker, Jeffrey P., to Quadra Wheelchairs, Inc. Wheelchair construction. 4,515,383, Cl. 280-242.0WC.
Minnesota Mining and Manufacturing Company: *See*—
Beretta, Paolo; and Kitchin, Jonathan P., 4,515,888, Cl. 430-584.000.
Coles, Robert F., 4,515,955, Cl. 548-150.000.
Gatzke, Kenneth G.; and Winslow, John M., 4,515,885, Cl. 430-175.000.
Rood, Robert M.; and Wulfing, James J., 4,515,323, Cl. 242-74.100.
Wulfing, James J.; and Rood, Robert M., 4,515,330, Cl. 242-197.000.
Minolta Camera Kabushiki Kaisha: *See*—
Fukui, Kazuyuki, 4,515,358, Cl. 271-122.000.
Mioche, Robert, to Compagnie Generale des Etablissements Michelin. Apparatus for forming and cutting latex blocks into strips. 4,515,548, Cl. 425-308.000.
Miramanda, Fernando X. Stopper for containers for use in analyses. 4,515,752, Cl. 422-99.000.
Misawa Home Co., Ltd.: *See*—
Kataishi, Takao; and Seo, Iwazou, 4,515,552, Cl. 425-436.0RM.
Missio, Bruno; and Giorgioni, Angelo, to Girogioni di A. Giorgioni & C. s.a.s. Apparatus for driving take-up elements for palletizable load units. 4,515,025, Cl. 74-27.000.
Mr. Gasket Company: *See*—
Carlo, Louis D., 4,515,033, Cl. 74-476.000.
Mita Industrial Company Limited: *See*—
Kawahara, Yoshihiro; and Hayashi, Kiyoshi, 4,516,141, Cl. 346-153.100.
Miyoshi, Hideo; Umeda, Tadashi; and Aoki, Takashi, 4,515,465, Cl. 355-14.00C.
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikawa, Yasuhiko; and Nagashima, Takashi, 4,515,464, Cl. 355-14.00R.
Mitsubishi Chemical Industries Limited: *See*—
Niwa, Toshio; and Hihara, Toshio, 4,515,716, Cl. 534-635.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Horikoshi, Hiroshi; Arai, Akio; Tsukagoshi, Sadayuki; and Sakamoto, Junichi, 4,515,365, Cl. 273-25.000.
Ishida, Masayuki, 4,516,219, Cl. 364-900.000.
Kajiyama, Ryuichi; and Yonemoto, Masashi, 4,515,246, Cl. 187-29.00R.
Morishita, Etsuo, 4,515,539, Cl. 418-55.000.
Murata, Shirou; Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,002, Cl. 200-144.00C.
Nishimura, Tadashi, 4,514,895, Cl. 29-571.000.
Ohta, Kazutoshi, 4,515,248, Cl. 187-67.000.
Shiraishi, Akiyoshi, 4,515,417, Cl. 384-445.000.
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,003, Cl. 200-144.00C.
Mitsubishi Denki Kabushiki Kaishi: *See*—
Matsuzaki, Tadashi; and Sumi, Koji, 4,516,183, Cl. 361-71.000.
Mitsubishi Plastics Industries Limited: *See*—
Hashimoto, Tadashi, 4,515,269, Cl. 206-334.000.
Mitsubishi Rayon Company, Limited: *See*—
Adachi, Kiyoshi; Uehara, Masaru; Kitagawa, Hiroshi; Kojima, Hirotaka; and Sato, Masaaki, 4,514,965, Cl. 53-553.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.
Miwa, Kishio: *See*—
Inoue, Takehisa; and Miwa, Kishio, 4,515,605, Cl. 55-26.000.
Miya, Toyofumi; Kobayashi, Yukiharu; and Yano, Masao, to Kohjin Co., Ltd. Crystal of beta-nicotinamide-adenine-dinucleotide and process for preparing the same. 4,515,943, Cl. 536-27.000.
Miyajima, Yukio. Fancy article for use as a greeting gift such as a greeting card. 4,515,838, Cl. 428-14.000.
Miyakoshi, Yasushi: *See*—
Fujii, Kunihisa; Tomono, Noboru; Watanabe, Hajime; and Miyakoshi, Yasushi, 4,516,099, Cl. 335-135.000.
Miyamoto, Kiyoshi: *See*—
Nishimura, Shinichi; Mizuno, Saburo; and Miyamoto, Kiyoshi, 4,515,404, Cl. 296-65.00R.
Miyata, Katsuro; Asaida, Takashi; and Nagumo, Fumio, to Sony Corporation. Solid state television camera with iris control. 4,516,172, Cl. 358-228.000.
Miyata, Tatsuhiko: *See*—
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.000.

Miyoshi, Hideo; Umeda, Tadashi; and Aoki, Takashi, to Mita Industrial Company Limited. Electrostatic copying apparatus. 4,515,465, Cl. 355-14.00C.

Mizoguchi, Hitoshi: *See—*
Kobayashi, Akio; Mizoguchi, Hitoshi; Ikeda, Hisatoshi; and Mayama, Hidekiyo, 4,516,006, Cl. 200-148.00A.

Mizokami, Hiroshi: *See—*
Kawahara, Tetsuo; Mizokami, Hiroshi; Mizuno, Kyosuke; and Susumi, Sadao, 4,515,714, Cl. 260-112.00R.

Mizrach, Amos: *See—*
Feller, Ron; and Mizrach, Amos, 4,515,276, Cl. 209-693.000.

Mizuguchi, Yoshihiko: *See—*
Watanabe, Fumio; Mizuguchi, Yoshihiko; and Yamada, Matsuichi, 4,516,128, Cl. 343-761.000.

Mizukami, Masao: *See—*
Hayase, Isao; Mizukami, Masao; and Kishi, Atsuo, 4,515,513, Cl. 418-101.000.

Mizuno, Kyosuke: *See—*
Kawahara, Tetsuo; Mizokami, Hiroshi; Mizuno, Kyosuke; and Susumi, Sadao, 4,515,714, Cl. 260-112.00R.

Mizuno, Saburo: *See—*
Nishimura, Shinichi; Mizuno, Saburo; and Miyamoto, Kiyoshi, 4,515,404, Cl. 296-65.00R.

Mizuo, Yasuhiko. Apparatus for manufacturing screened cable. 4,514,971, Cl. 57-9.000.

Mobay Chemical Corporation: *See—*
Baron, Arthur L.; and Krishnan, Sivaram, 4,515,937, Cl. 528-204.000.
Witman, Mark W., 4,515,921, Cl. 525-67.000.

Mobil Oil Corporation: *See—*
Chang, Clarence D.; and Miale, Joseph N., 4,515,682, Cl. 208-111.000.
Chen, Nai Y.; and Miale, Joseph N., 4,515,892, Cl. 435-161.000.
Fitch, John L.; and Strubhar, Malcolm K., 4,515,214, Cl. 166-250.000.
Hoskin, Dennis H., 4,515,701, Cl. 252-8.55D.
Walsh, Dennis E.; and Green, Gary J., 4,515,092, Cl. 110-347.000.
Zemanek, Joseph, Jr., 4,516,228, Cl. 367-75.000.

Mochalova, Zoya N.: *See—*
Gnatchenko, Viktor V.; Makarov, Nikolai P.; Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Panteleev, Valery A.; Androsenko, Alexandr P.; Davidenko, Nikolai I.; Mochalova, Zoya N.; and Palkin, Leonid N., 4,515,045, Cl. 81-429.000.

Mod, William A.: *See—*
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,515,989, Cl. 568-674.000.

Moeddel, Robert W., to Procter & Gamble Company, The. Compositions containing odor purified proteolytic enzymes and perfumes. 4,515,705, Cl. 252-174.120.

Mohr, Ernst, to Fides Treuhand GmbH. Hot-gas piston type engine. 4,514,979, Cl. 60-512.000.

Mohr, Heinz: *See—*
Bleckmann, Gerhard; Lynch, John; and Mohr, Heinz, 4,515,375, Cl. 277-1.000.

Molitor, Edwin A.; Crain, Edward; and Lampe, Guy W., to Multifold-International, Inc. Machine for erecting, holding and discharging a folding case. 4,515,581, Cl. 493-183.000.

Mollick, Joseph T.: *See—*
Brashears, David F.; and Mollick, Joseph T., 4,515,090, Cl. 110-264.000.

Molt, Kenneth R., to Morton Thiokol Inc. Stabilizers for halogen containing polymers comprising zinc mercaptoesters, basic inorganic alkali or alkaline earth metal compounds and, substituted dihydropyridines. 4,515,916, Cl. 524-99.000.

Momoshima, Yukichi; and Nagasaka, Nobuyuki, to Kabushiki Kaisha Daini Seikosha. Musical sound wave generating circuit for electronic musical instrument. 4,515,057, Cl. 84-1.030.

Monsanto Company: *See—*
Bachman, Gerald L.; and Vineyard, Billy D., 4,515,731, Cl. 260-465.00D.
Broaddus, Wayne R.; Jaber, Khalil N.; and Orofino, Thomas A., 4,515,839, Cl. 428-17.000.
Wrobleski, James T., 4,515,973, Cl. 549-259.000.

Moog Automotive, Inc.: *See—*
Martin, Tony E., 4,515,042, Cl. 81-55.000.

Moon, Ronald R.: *See—*
Moon, William G.; Moon, Ronald R.; Peterson, Bruce R.; and Westwood, Donald C., 4,516,177, Cl. 360-77.000.

Moon, William G.; Moon, Ronald R.; Peterson, Bruce R.; and Westwood, Donald C., to Quantum Corporation. Rotating rigid disk data storage device. 4,516,177, Cl. 360-77.000.

Moore, James H.: *See—*
Breedlove, Paul S.; and Moore, James H., 4,516,260, Cl. 381-51.000.

Moore, Jerry R.; and Van Dusseldorp, C. Peter. Extension device for electrically powered tools. 4,515,423, Cl. 339-28.000.

Moore, Ted E., Sr. Debris collector. 4,515,504, Cl. 408-67.000.

Moosbrucker, Karl; Hollmann, Bernd; and Freye, Theodor. Apparatus for producing a wrapped cylindrical bale of harvested agricultural material. 4,514,969, Cl. 56-341.000.

Moran, Daniel B.: *See—*
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,515,791, Cl. 514-248.000.

Moran, David P. J.; and Sharp, David G., to Lever Brothers Company. Low fat spread and process for producing same. 4,515,825, Cl. 426-603.000.

Moran, Paul R., to Wisconsin Alumni Research Foundation. NMR scanner with motion zeugmatography. 4,516,075, Cl. 324-309.000.

Morca, Inc.: *See—*
Cruz, Mamerto M., Jr., 4,515,633, Cl. 106-18.260.

Morenus, Richard J.: *See—*
Frisbie, Richard C.; Houser, David E.; Morenus, Richard J.; and Thomas, Edwin L., 4,515,505, Cl. 409-163.000.

Mori, Shigeru; Kudo, Yoshiaki; and Kuwata, Satoshi, to Shin-Etsu Chemical Co., Ltd. Heat-resistant silicone fluid compositions. 4,515,702, Cl. 252-49.600.

Mori, Takasuke: *See—*
Narita, Kiichi; Mori, Takasuke; and Ayata, Kenzo, 4,515,203, Cl. 164-468.000.

Mori, Toshihito: *See—*
Iwasaki, Akio; Deushi, Takeo; Watanabe, Isamu; and Mori, Toshihito, 4,515,942, Cl. 536-16.800.

Morimoto, Kiyoshi: *See—*
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikuwa, Yasuhiko; and Nagashima, Takashi, 4,515,464, Cl. 355-14.00R.

Morimoto, Kotaro; and Suzuki, Tomio, to Kobe Steel, Ltd. Combustion method for reducing the emission of nitrogen oxides. 4,515,553, Cl. 431-8.000.

Morimoto, Yoshiro: *See—*
Takeuchi, Yasuhisa; Morimoto, Yoshiro; and Suzuki, Tadashi, 4,515,040, Cl. 74-866.000.

Morishita, Etsuo, to Mitsubishi Denki Kabushiki Kaisha. Scroll-type hydraulic machine with two axially spaced scroll mechanisms. 4,515,539, Cl. 418-55.000.

Morito, Motoyoshi: *See—*
Nakata, Yukio; Terada, Matsuaki; Suda, Kaoru; Morito, Motoyoshi; and Shiotsu, Osamu, 4,516,221, Cl. 364-900.000.

Moriyama, Masakazu; Shinohara, Toshio; Hirano, Kazuo; and Makino, Fumio, to Toyota Motor Co., Ltd.; and Sumitomo Electric Industries, Ltd. Transmission control system. 4,516,121, Cl. 340-825.050.

Moriyama, Masakazu; and Saito, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for controlling air conditioner by voice. 4,516,207, Cl. 364-424.000.

Moriyama, Naomune; and Ohtani, Fumiyuki, to Mazda Motor Corporation. Retractable head-light device for automobiles. 4,516,191, Cl. 362-65.000.

Moroder, Luis: *See—*
Valet, Gunter; Ruhenstroth-Bauer, Gerhard; Wunsch, Erich; and Moroder, Luis, 4,515,730, Cl. 260-465.00D.

Moroe, Michio: *See—*
Sawano, Kiyohito; Kouichi, Ryujiro; Oota, Hideaki; Takano, Masashi; and Moroe, Michio, 4,515,909, Cl. 523-102.000.

Morotti, Mauro: *See—*
Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, 4,515,809, Cl. 514-533.000.

Morrill, David R.; Mason, Mark T.; and Green, Paul M., to Klimsch/Optronics. Scanner/plotter optical system. 4,516,023, Cl. 250-235.000.

Morrison Products, Inc.: *See—*
Baker, Harold L., 4,515,527, Cl. 416-184.000.

Morton Thiokol Inc.: *See—*
Molt, Kenneth R., 4,515,916, Cl. 524-99.000.

Moser, Kurt; and Hofmann, Rolf, to Develop Dr. Eisbein GmbH & Co. Press fixing apparatus with three pressing rollers. 4,515,459, Cl. 355-3.0FU.

Mosier, Donald E., to Rockwell International Corporation. Mounting structure for multiple liquid crystal displays. 4,515,440, Cl. 350-334.000.

Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza: *See—*
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; and Karavaev, Alexandr A., 4,515,157, Cl. 128-303.00R.

Motomura, Kenichi; Ogawa, Hiroshi; Yamamoto, Akira; and Hagita, Noriyuki, to Bridgestone Tire Company Limited. Heavy duty pneumatic radial tire. 4,515,197, Cl. 152-209.00R.

Motorola, Inc.: *See—*
Baumann, William J., 4,516,220, Cl. 364-715.000.
Davis, Earl K.; Drye, James E.; and Reed, David J., 4,515,898, Cl. 501-15.000.
Gallup, Michael G., 4,516,251, Cl. 377-110.000.
Phillips, James P., 4,516,270, Cl. 455-302.000.
Sasser, Bill H., 4,516,091, Cl. 333-161.000.
Siwiak, Kazimierz, 4,516,127, Cl. 343-702.000.
Smith, Michael D.; and Whatley, Roger A., 4,516,082, Cl. 330-296.000.
Turney, William J., 4,516,083, Cl. 331-1.00A.

Mount, Gordon L., to Carrier Corporation. Method and control system for protecting an electric motor driven compressor in a refrigeration system. 4,514,989, Cl. 62-201.000.

Mouser, Curtis A.; Roberts, Mark G.; Haas, Daniel R.; and Lancaster, Patrick R., III, to Lantech, Inc. Feedback controlled stretch wrapping apparatus and process. 4,514,955, Cl. 53-64.000.

Mowatt-Larssen, Erling, to General American Transportation Corporation. Molten sulfur tank car assembly. 4,515,189, Cl. 141-11.000.

Moxon, Edwin C., to Stypher Corporation. Apparatus for decoding video address code signals. 4,516,164, Cl. 360-53.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See—*
Hagemeister, Klaus, 4,515,305, Cl. 228-173.200.

Mueller, Gerhard: *See*—
Lechtken, Peter; Mueller, Gerhard; and Schmieder, Klaus, 4,515,982, Cl. 560-125.000.

Muhle, Herbert: *See*—
Brich, Zdenek; and Muhle, Herbert, 4,515,950, Cl. 546-67.000.

Muhlhofer, Ernst: *See*—
Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Muhlhofer, Ernst; and Schwab, Michael, 4,515,762, Cl. 423-337.000.

Muller, Gerhard; and Schwarz, Jurgen, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Optical system for transmitted-light microscopy with incident illumination. 4,515,445, Cl. 350-524.000.

Muller, Gerhard: *See*—
Weimer, Eugen; and Muller, Gerhard, 4,515,447, Cl. 350-527.000.

Muller, Johann: *See*—
Preiner, Gerhard; and Muller, Johann, 4,515,976, Cl. 556-453.000.

Muller, Norbert W.: *See*—
Dietz, Peter; Muller, Norbert W.; and Kroh, Horst F. M., 4,515,049, Cl. 82-36.00R.

Muller, Rene : *See*—
Chaudhari, Praveen; and Muller, Rene , 4,515,650, Cl. 156-622.000.

Muller, Rudolf; Radeklau, Hans-Jurgen; Dofke, Harald; and Krieger, Detlef, to Schering Aktiengesellschaft. Apparatus for removing substances from the inner walls of vessels. 4,515,483, Cl. 366-303.000.

Mullritter, Ludwig; Schnall, Gunther; and Fruth, Franz, to Agfa-Gevaert Aktiengesellschaft. Spring biased crank arm drive for tray mounted stapler. 4,515,356, Cl. 270-53.000.

Multifold-International, Inc.: *See*—
Molitor, Edwin A.; Crain, Edward; and Lampe, Guy W., 4,515,581, Cl. 493-183.000.

Multisafe AG: *See*—
Eder, Helmut, 4,514,951, Cl. 52-660.000.

Multivac Sepp Haggenmuller, KG: *See*—
Medwed, Emmerich, 4,515,546, Cl. 425-195.000.

Mumola, Peter B.: *See*—
La Fiandra, Carlo; and Mumola, Peter B., 4,516,062, Cl. 318-676.000.

Munakata, Akio: *See*—
Abe, Susumu; Munakata, Akio; and Kitahara, Takeshi, 4,516,173, Cl. 358-261.000.

Munson, Robert E.; and Haddad, Hussain A., to Ball Corporation. Apparatus and method for coupling r.f. energy through a mechanically rotatable joint. 4,516,097, Cl. 333-261.000.

Munson, Ronald W.: *See*—
Jacobson, Roger K.; and Munson, Ronald W., 4,515,273, Cl. 206-604.000.

Munzel, Hermann: *See*—
Mengel, Hans-Eckhard; and Munzel, Hermann, 4,515,226, Cl. 175-57.000.

Muralidhara, Ranya: *See*—
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,966, Cl. 549-30.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,967, Cl. 549-39.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,515,968, Cl. 549-39.000.

Muramatsu, Motoyasu: *See*—
Suzuki, Yukio; Sato, Kunihiko; and Muramatsu, Motoyasu, 4,515,131, Cl. 123-491.000.

Muraoka, Hisashi: *See*—
Matsuo, Shuitsu; Imanishi, Yasuhiro; Nagashima, Hideo; Watanabe, Masaharu; Usami, Toshiro; and Muraoka, Hisashi, 4,515,755, Cl. 422-246.000.

Murata Manufacturing Co., Ltd.: *See*—
Shikama, Takashi; Yamamoto, Tomoyuki; and Yokota, Atsuo, 4,516,054, Cl. 315-71.000.

Murata, Shirou; Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker with arc light absorber. 4,516,002, Cl. 200-144.00C.

Murata, Shirou: *See*—
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,003, Cl. 200-144.00C.

Murdock, Keith C.: *See*—
Lang, Stanley A., Jr.; and Murdock, Keith C., 4,515,954, Cl. 548-109.000.

Murphy, James P. Lighting system for artificial Christmas tree. 4,516,193, Cl. 362-123.000.

Muto, Yasuo: *See*—
Asai, Koichi; Tsuda, Mamoru; Oe, Kunio; and Muto, Yasuo, 4,515,507, Cl. 414-226.000.

Myers, David E.: *See*—
DuVal, Daniel A.; Kahn, Roger N.; and Myers, David E., 4,515,396, Cl. 281-15.00R.

Myers, Richard A., to St. Regis Corporation. Modified atmosphere package and process. 4,515,266, Cl. 206-205.000.

N P Marketing Corporation: *See*—
Van Gompel, James; and Akey, Ronald R., 4,515,506, Cl. 410-46.000.

N. V. Bekaert S.A.: *See*—
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,515,905, Cl. 502-309.000.

N. V. Raychem S. A.: *See*—
Wille, Marc, 4,515,831, Cl. 427-223.000.

Naab, Paul: *See*—
Metzger, Karl G.; Schrock, Wilfried; Habich, Dieter; Naab, Paul; and Zeiler, Hans-Joachim, 4,515,789, Cl. 514-196.000.

Nagahara, Shusaku: *See*—
Nishizawa, Shigeki; Nagahara, Shusaku; and Ozawa, Naoki, 4,516,154, Cl. 358-46.000.

Nagamine, Tsuyoshi: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Fujibayashi, Kentaro, 4,516,211, Cl. 364-474.000.

Nagasaka, Nobuyuki: *See*—
Momoshima, Yukichi; and Nagasaka, Nobuyuki, 4,515,057, Cl. 84-1.030.

Nagase, Hiroshi: *See*—
Ninomiya, Hisakazu; Ibori, Satoshi; Nagase, Hiroshi; Igarashi, Sadayuki; and Sugai, Hiroshi, 4,516,065, Cl. 318-811.000.

Nagashima, Hideo: *See*—
Matsuo, Shuitsu; Imanishi, Yasuhiro; Nagashima, Hideo; Watanabe, Masaharu; Usami, Toshiro; and Muraoka, Hisashi, 4,515,755, Cl. 422-246.000.

Nagashima, Kazuo, to Toshiba Kikai Kabushiki Kaisha. Control system for roll grinding machine. 4,516,212, Cl. 364-475.000.

Nagashima, Takashi: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikawa, Yasuhiko; and Nagashima, Takashi, 4,515,464, Cl. 355-14.00R.

Nagumo, Fumio: *See*—
Miyata, Katsuro; Asaida, Takashi; and Nagumo, Fumio, 4,516,172, Cl. 358-228.000.

Naimpally, Saiprasad V.: *See*—
Krull, Donald K.; and Naimpally, Saiprasad V., 4,516,153, Cl. 358-31.000.

Nakagawa, Hiroshi: *See*—
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.000.

Nakagawa, Shiro; and Kuroiwa, Akihiko, to TDK Electronics Co., Ltd. Optical recording system. 4,516,234, Cl. 369-109.000.

Nakajima, Tsuyoshi: *See*—
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,515,709, Cl. 252-509.000.

Nakajima, Yasushi: *See*—
Sakura, Yasuhiro; Nakajima, Yasushi; Tajima, Noriyasu; and Nimura, Hitoshi, 4,516,208, Cl. 364-466.000.

Nakamura, Michael D., to Tektronix, Inc. Clamp circuits. 4,516,042, Cl. 307-546.000.

Nakamura, Minoru; and Asami, Kazuto, to Glory Kogyo Kabushiki Kaisha. Coin stacking apparatus for a coin packaging machine or the like. 4,515,172, Cl. 133-8.00A.

Nakanishi, Teruo: *See*—
Nakano, Jun; Nakanishi, Teruo; and Kimura, Kazuhiko, 4,515,977, Cl. 549-468.000.

Nakano, Hidetaka, to Yamaichi Electric Mfg. Co., Ltd. IC socket with IC package pressing means. 4,515,425, Cl. 339-75.0MP.

Nakano, Jun; Nakanishi, Teruo; and Kimura, Kazuhiko, to Kaken Pharmaceutical Co., Ltd. Process for preparing optically active [S]-2-acetyl-7-(hydroxy-3-isopropylaminopropoxy)-benzofuran and salts thereof. 4,515,977, Cl. 549-468.000.

Nakano, Yoshikatsu: *See*—
Matsuura, Masaaki; and Nakano, Yoshikatsu, 4,515,121, Cl. 123-198.00F.

Nakata, Yukio; Terada, Matsuaki; Suda, Kaoru; Morito, Motoyoshi; and Shiotsu, Osamu, to Hitachi, Ltd.; and Yagi Antenna Co., Ltd. Data communication system. 4,516,221, Cl. 364-900.000.

Nakaya, Mitsuo: *See*—
Kajigaya, Shinichi; and Nakaya, Mitsuo, 4,515,502, Cl. 405-215.000.

Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for manufacturing non-fired iron-bearing pellet. 4,515,351, Cl. 266-177.000.

Nakayama, Sumio: *See*—
Honma, Kenji; Asami, Toshio; Baba, Masayuki; and Nakayama, Sumio, 4,515,384, Cl. 280-276.000.

Nalco Chemical Company: *See*—
Fong, Dodd W., 4,515,658, Cl. 162-168.400.

Nancarrow, James N.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,515,136, Cl. 123-564.000.

Nanodata Computer Corporation: *See*—
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,516,199, Cl. 364-200.000.

Napolitano, Pellegrino E., to Hudson Engineering Company. Valve for self-priming pump system. 4,515,180, Cl. 137-565.000.

Narato, Kiyoshi: *See*—
Azuhata, Shigeru; Arashi, Norio; Narato, Kiyoshi; Inada, Tooru; Souma, Kenichi; Ohtsuka, Keizou; Hishinuma, Yukio; and Masai, Tadahisa, 4,515,094, Cl. 110-347.000.

Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; and Yoshida, Toshihiro, to Computer Basic Technology Research Assoc. Thin film magnetic head. 4,516,180, Cl. 360-126.000.

Narita, Kiichi; Mori, Takasuke; and Ayata, Kenzo, to Kabushiki Kaisha Kobe Seiko Sho. Continuous steel casting process. 4,515,203, Cl. 164-468.000.

Narumiya, Yoshikazu: *See*—
Ishino, Ken; Hashimoto, Yasuo; Ichihara, Kenichi; and Narumiya, Yoshikazu, 4,515,850, Cl. 428-225.000.

National Distillers and Chemical Corporation: *See*—
Harris, Eugene G.; and Fayter, Richard G., Jr., 4,515,978, Cl. 549-484.000.

National Research Development Corporation: *See*—
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,515,808, Cl. 514-521.000.
Payne, David N.; Sasaki, Issei; and Adams, Michael J., 4,515,475, Cl. 356-73.100.
Skorecki, Jan, 4,515,122, Cl. 123-198.00E.

National Semiconductor Corporation: *See*—
Sherwin, James S., 4,515,432, Cl. 350-96.200.

NCR Corporation: *See*—
Rhoads, Paul M.; and Cheffer, Harold H., 4,516,035, Cl. 307-66.000.

Needham, Riley B.: *See*—
Beardmore, David H.; and Needham, Riley B., 4,515,093, Cl. 110-347.000.

Negus, Paul D.: *See*—
Cook, Andrew J.; and Negus, Paul D., 4,516,249, Cl. 375-82.000.

Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, to Matsushita Electric Industrial Co., Ltd. Sewing machine having a memory for generating a speed signal in response to operating conditions. 4,516,061, Cl. 318-561.000.

Nelson, David A., to Rockwell International Corporation. Electronic display dimming circuit. 4,516,055, Cl. 315-151.000.

Nelson, Rodney J.: *See*—
Cathey, Thaddeus F.; Gaynor, John C.; and Nelson, Rodney J., 4,515,577, Cl. 474-204.000.

Nemoto, Michio; Yoshida, Kiyokazu; and Baba, Tetsuro, to Tohoku Metal Industries, Ltd. Air-flow-rate sensors. 4,516,101, Cl. 335-208.000.

Neuhaus, J. D.: *See*—
Reiffert, Werner; Peters, Dieter; and Wiendahl, Joachim, 4,515,183, Cl. 137-625.210.

Neumann, Guenter J.: *See*—
Haley, William J.; and Neumann, Guenter J., 4,515,255, Cl. 192-3.570.

Neuray, Dieter: *See*—
Nouvertne, Werner; Serini, Volker; Neuray, Dieter; Binsack, Rudolf; Gehrke, Hans-Georg; Rempel, Dieter; and Krishnai, Sivara, 4,515,918, Cl. 524-504.000.

Newgard, Peter J.: *See*—
Slemmons, Arthur J.; and Newgard, Peter J., 4,515,151, Cl. 126-450.000.

Newhouse, Denis P. Rosin bar holder. 4,515,272, Cl. 206-592.000.

Newman, Dennis W.: *See*—
Hawkinson, Raymond P., Jr.; and Newman, Dennis W., 4,516,068, Cl. 324-54.000.

Newman, Peter M.; and Jenkins, Anthony W., to Fisons plc. Soluble sodium cromoglycate compositions. 4,515,805, Cl. 514-460.000.

Nibert, Charles W.: *See*—
Beck, H. Wayne; Lochow, Charles F., Jr.; and Nibert, Charles W., 4,515,683, Cl. 208-113.000.

Nicholson, William J.: *See*—
Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., 4,515,704, Cl. 252-135.000.

Nijman, John P.: *See*—
Margolin, Mark; Grois, Igor; Herdeg, Peter K.; and Nijman, John P., 4,515,434, Cl. 350-96.210.

Nike, Inc.: *See*—
Aarflot, Kjell, 4,514,916, Cl. 36-117.000.

Nimura, Hitoshi: *See*—
Sakura, Yasuhiro; Nakajima, Yasushi; Tajima, Noriyasu; and Nimura, Hitoshi, 4,516,208, Cl. 364-466.000.

Ninomiya, Hisakazu; Ibori, Satoshi; Nagase, Hiroshi; Igarashi, Sadayuki; and Sugai, Hiroshi, to Hitachi, Ltd.; and Hitachi Keiyo Eng. Co., Ltd. Control apparatus for AC motors. 4,516,065, Cl. 318-811.000.

Nippon Air Brake Co., Ltd.: *See*—
Ishiwata, Ichiro, 4,514,980, Cl. 60-534.000.

Nippon Kogaku K.K.: *See*—
Wakabayashi, Hiroshi; Okabe, Nobuo; and Daitoku, Koichi, 4,515,453, Cl. 354-149.100.

Nippon Kokan Kabushiki Kaisha: *See*—
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,515,352, Cl. 266-218.000.
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,515,351, Cl. 266-177.000.
Shibata, Yoichi; Kimura, Ryosuke; Sumigama, Takashi; and Izumi, Masaro, 4,515,350, Cl. 266-92.000.

Nippon Light Metal Company Limited: *See*—
Ohno, Atsumi, 4,515,204, Cl. 164-483.000.

Nippon Soda Company Limited: *See*—
Iwataki, Isao; Fujita, Kagari; Ishikawa, Hisao; Hosaka, Hideo; and Kohara, Kenichi, 4,515,729, Cl. 260-464.000.

Nippon Steel Corporation: *See*—
Sawatani, Tadashi; Ishii, Mitsuo; Yoshimura, Hirofumi; and Harase, Jirou, 4,515,644, Cl. 148-12.0EA.

Nippon Telegraph & Telephone Public Corp.: *See*—
Yoshihara, Hideo; Ozawa, Akira; Sekimoto, Misao; and Ono, Toshiro, 4,515,876, Cl. 430-5.000.

Nippon Zeon Co. Ltd.: *See*—
Ogura, Shunichiro; and Soumai, Masamichi, 4,515,661, Cl. 203-60.000.

Nippondenso Co., Ltd.: *See*—
Hara, Masahiro; Okamoto, Atsutoshi; and Sakai, Toshiyasu, 4,516,017, Cl. 235-472.000.
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.

Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co.). Kerosene combustion apparatus. 4,515,557, Cl. 431-302.000.

Nishikawa, Kazunori: *See*—
Masuda, Isao; Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Ueno, Shoji, 4,516,163, Cl. 360-32.000.

Nishikawa, Mineki: *See*—
Yamakawa, Tsutomu; Nishikawa, Mineki; and Kihara, Tomohiko, 4,516,025, Cl. 250-252.100.

Nishimura, Shinichi; Mizuno, Saburo; and Miyamoto, Kiyoshi, to Nissan Motor Company, Limited; and Ohio Seisakusho Co., Ltd. Seat sliding device. 4,515,404, Cl. 296-65.00R.

Nishimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Method of forming field-effect transistors using selectively beam-crystallized polysilicon channel regions. 4,514,895, Cl. 29-571.000.

Nishimura, Takeo: *See*—
Katabe, Kenichi; and Nishimura, Takeo, 4,515,852, Cl. 428-246.000.

Nishio, Ken-ichi: *See*—
Okamoto, Hideho; Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,515,866, Cl. 428-614.000.

Nishioka, Yoshiki: *See*—
Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Nishioka, Yoshiki, 4,516,215, Cl. 364-513.500.

Nishizawa, Shigeki; Nagahara, Shusaku; and Ozawa, Naoki, to Hitachi, Ltd. Solid state color imaging system. 4,516,154, Cl. 358-44.000.

Nissan Motor Company, Limited: *See*—
Hayashi, Yoshimasa, 4,515,116, Cl. 123-90.430.
Hayashi, Yoshimasa; and Ogawa, Naoki, 4,515,119, Cl. 123-198.00E.
Hayashi, Yoshimasa, 4,515,124, Cl. 123-324.000.
Hidaka, Kunihiko; Fukushima, Naoto; and Iwata, Kazuro, 4,515,252, Cl. 188-282.000.
Koide, Masaru, 4,515,391, Cl. 280-690.000.
Kubota, Hitoshi, 4,514,984, Cl. 60-585.000.
Nishimura, Shinichi; Mizuno, Saburo; and Miyamoto, Kiyoshi, 4,515,404, Cl. 296-65.00R.
Sakurai, Yukio; and Yamamoto, Akihiko, 4,515,208, Cl. 165-43.000.
Takeuchi, Yasuhisa; Morimoto, Yoshiro; and Suzuki, Tadashi, 4,515,040, Cl. 74-866.000.
Yasuhara, Seishi, 4,515,690, Cl. 210-90.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Yamamoto, Katsuhiro; Matsumoto, Katsuo; and Okada, Yoshiyuki, 4,515,162, Cl. 128-640.000.

Niwa, Toshio; and Hihara, Toshio, to Mitsubishi Chemical Industries Limited. 2,6-Diaminopyridine-based azo dyes for cellulose-containing fibers. 4,515,716, Cl. 534-635.000.

NL Industries, Inc.: *See*—
Burnes, Edward E.; and Bhatia, Kishan, 4,515,759, Cl. 423-220.000.
Weido, Vincent C.; and Grissom, David, 4,515,010, Cl. 73-151.000.

Noda, Akiko, heir: *See*—
Yajima, Seishi, deceased; Noda, Akiko, heir; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamaura, Takemi, 4,515,742, Cl. 264-63.000.

Nojima, Kazuhiro; Fujimoto, Hiroyuki; and Takahashi, Mikio, to Kanzaki Paper Mfg. Co., Ltd. Method of producing cast coated paper and product thereof. 4,515,833, Cl. 427-362.000.

Nolting, Peter; and Bleger, Claude, to Robert Bosch GmbH. Temperature sensing module. 4,516,106, Cl. 338-28.000.

Nolting, Rolf; and Siniza, Bernhard, to VEB Ingenieurbuero fuer Meliorationen. Control impulse intensifier. 4,515,175, Cl. 137-107.000.

Nomura, Takeo: *See*—
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, 4,515,785, Cl. 424-195.100.

Noon, Robert A.: *See*—
Kay, Ian T.; and Noon, Robert A., 4,515,959, Cl. 548-378.000.

Noord-Nederlandsche Machinefabriek B.V.: *See*—
van Os, Cornelis J., 4,515,536, Cl. 417-394.000.

Nord, Keith W., to Ex-Cell-O Corporation. Robot joint. 4,515,039, Cl. 74-665.00C.

Nordson Corporation: *See*—
Cobbs, Walter H., Jr.; and Rehman, William R., 4,515,836, Cl. 427-425.000.

Norman, Cary A.: *See*—
Chester, Martin H.; and Norman, Cary A., 4,515,168, Cl. 128-741.000.

North, William E.; Holden, Paul C.; and Hultgren, Kent G., to Westinghouse Electric Corp. Cooling arrangement for airfoil stator vane trailing edge. 4,515,523, Cl. 415-115.000.

Northern Telecom Limited: *See*—
Berger, Jean P., 4,515,304, Cl. 228-136.000.
Garner, John N.; and Shannon, Michael A., 4,515,826, Cl. 427-8.000.
Hadziomerovic, Faruk, 4,516,236, Cl. 370-24.000.
Hampel, Herbert J.; and Willers, Arthur G., 4,515,419, Cl. 312-7.100.

Northmore, James E. Camera movement synchronizing apparatus. 4,515,455, Cl. 354-293.000.

Norton Christensen, Inc.: *See*—
Mengel, Hans-Eckhard; and Munzel, Hermann, 4,515,226, Cl. 175-57.000.

Norton, William J., to C. R. Bard, Inc. Medical tubing having exterior hydrophilic coating for microbiocide absorption therein and method for using same. 4,515,593, Cl. 604-265.000.

Nouvertne, Werner; Serini, Volker; Neuray, Dieter; Binsack, Rudolf; Gehrke, Hans-Georg; Rempel, Dieter; and Krishnai, Sivara, to Bayer

Aktiengesellschaft. Thermoplastic moulding compositions based on polycarbonate, polyalkylene terephthalate and, optionally, one or more polymers. 4,515,918, Cl. 524-504.000.
Novak, W. Thomas, to Micronix Partners. Lithography system. 4,516,253, Cl. 378-034.000.
Novatome: *See*—
Jullien, Georges, 4,515,109, Cl. 122-32.000.
Nowakowski, Robert J., to General Motors Corporation. Dual-voltage battery charging system. 4,516,066, Cl. 320-15.000.
Nowobilski, Jeffert J.; and Kather, Kenneth C., to Union Carbide Corporation. Vacuum insulated conduit. 4,515,397, Cl. 285-47.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Fujibayashi, Kentaro, to Fujitsu Fanuc Limited. Numerical control system. 4,516,211, Cl. 364-474.000.
Nueller, Karl F.: *See*—
Kaschig, Jurgen; Kleiner, Eduard K.; Nueller, Karl F.; and Cooke, Thomas W., 4,515,640, Cl. 106-287.250.
Numata, Masanori: *See*—
Iwasawa, Hiroshi; Numata, Masanori; and Mama, Shinichi, 4,516,138, Cl. 346-80.000.
Numata, Takuhisa: *See*—
Sakurai, Yoshifumi; and Numata, Takuhisa, 4,516,222, Cl. 365-32.000.
Nurney, David J., to Indian Industries, Inc. Compound bow and eccentric wheel assemblies therefor. 4,515,142, Cl. 124-23.00R.
Nussbaum, Joel H., to Standard Products Company, The. Thermoplastic elastomer molding. 4,515,649, Cl. 156-244.110.
Nyffeler, Felix, to Siemens-Albis AG. Surface acoustic wave filter. 4,516,093, Cl. 333-193.000.
Nylco Corporation: *See*—
Coughlin, Thomas E., 4,515,844, Cl. 428-82.000.
O.C.C. Company Limited: *See*—
Ohno, Atsumi, 4,515,204, Cl. 164-483.000.
O.P.E. Co. Ltd.: *See*—
Manabe, Nobuyuki; and Goto, Takahiro, 4,515,312, Cl. 239-227.000.
Oakley, Inc.: *See*—
Tackles, George, 4,515,448, Cl. 351-41.000.
Oar, Ross C.: *See*—
Barbieri, John J.; and Oar, Ross C., 4,514,883, Cl. 24-163.00K.
Occidental Research Corporation: *See*—
Blumer, David J., 4,515,756, Cl. 423-54.000.
Oce-Nederland B.V.: *See*—
Deckers, Albert T.; and Leppink, Arie, 4,515,470, Cl. 355-105.000.
Eertink, Bastiaan B. B.; and van Esch, Hendrikus J., 4,516,019, Cl. 250-214.0RC.
Oda, Chikao: *See*—
Matsushita, Nobuo; Furukawa, Tokinobu; Shintani, Tetsuo; Sumitani, Tomoaki; and Oda, Chikao, 4,515,008, Cl. 73-53.000.
Oda, Kengo: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.
O'Donnell, Timothy W.: *See*—
Olson, Daniel R.; and O'Donnell, Timothy W., 4,515,931, Cl. 526-323.200.
Oe, Kunio: *See*—
Asai, Koichi; Tsuda, Mamoru; Oe, Kunio; and Muto, Yasuo, 4,515,507, Cl. 414-226.000.
Ogano, Takeo; Sueshige, Hiroshi; and Hatakeyama, Sakichi, to Honda Giken Kogyo Kabushiki Kaisha. Self-propelled working vehicle. 4,514,917, Cl. 37-249.000.
Ogawa, Hiroshi: *See*—
Motomura, Kenichi; Ogawa, Hiroshi; Yamamoto, Akira; and Hagita, Noriyuki, 4,515,197, Cl. 152-209.00R.
Ogawa, Masaki: *See*—
Sakakibara, Mitsuhiko; Yoshizawa, Masao; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,515,922, Cl. 525-99.000.
Ogawa, Naoki: *See*—
Hayashi, Yoshimasa; and Ogawa, Naoki, 4,515,119, Cl. 123-198.00E.
Ogishima, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Fairing device for motorcycles. 4,515,405, Cl. 296-78.100.
Ogura, Shunichiro; and Soumai, Masamichi, to Nippon Zeon Co. Ltd. Process for separating highly pure butene-1 and butene-2. 4,515,661, Cl. 203-60.000.
Ohio Agricultural Research and Development Center, The: *See*—
Holmes, Robert G., 4,515,291, Cl. 221-211.000.
Ohio Seisakusho Co., Ltd.: *See*—
Nishimura, Shinichi; Mizuno, Saburo; and Miyamoto, Kiyoshi, 4,515,404, Cl. 296-65.00R.
Ohio State University Research Foundation, The: *See*—
Shore, Sheldon G.; and Hsu, Wen-Liang, 4,515,728, Cl. 260-429.0CY.
Ohno, Atsumi, to Nippon Light Metal Company Limited; and O.C.C. Company Limited. Continuous metal casting. 4,515,204, Cl. 164-483.000.
Ohnuki, Mitsuo, to Konishiroku Photo Industry Co., Ltd. Lens barrel. 4,515,438, Cl. 350-255.000.
Ohshima, Jiro: *See*—
Ajima, Takashi; Ohshima, Jiro; and Koshino, Yutaka, 4,515,642, Cl. 148-1.500.
Ohta, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Buffer device for elevator. 4,515,248, Cl. 187-67.000.
Ohtani, Fumiyuki: *See*—
Moriyama, Naomune; and Ohtani, Fumiyuki, 4,516,191, Cl. 362-65.000.
Ohtsuka, Keizou: *See*—
Azuhata, Shigeru; Arashi, Norio; Narato, Kiyoshi; Inada, Tooru; Souma, Kenichi; Ohtsuka, Keizou; Hishinuma, Yukio; and Masai, Tadahisa, 4,515,094, Cl. 110-347.000.
Ojserkis, Maurice J. Opening device for a trawl net. 4,514,924, Cl. 43-9.000.
Okabe, Nobuo: *See*—
Wakabayashi, Hiroshi; Okabe, Nobuo; and Daitoku, Koichi, 4,515,453, Cl. 354-149.100.
Okabe, Yoshikatsu: *See*—
Matsumoto, Shigeru; Okabe, Yoshikatsu; and Kazama, Yasuhiro, 4,516,133, Cl. 343-819.000.
Okada, Yoshiyuki: *See*—
Yamamoto, Katsuhiro; Matsumoto, Katsuo; and Okada, Yoshiyuki, 4,515,162, Cl. 128-640.000.
Okamoto, Atsutoshi: *See*—
Hara, Masahiro; Okamoto, Atsutoshi; and Sakai, Toshiyasu, 4,516,017, Cl. 235-472.000.
Okamoto, Hideho; Yamatsuta, Kohji; and Nishio, Ken-ichi, to Sumitomo Chemical Company, Limited. Fiber-reinforced metallic composite material. 4,515,866, Cl. 428-614.000.
Okamoto, Kei: *See*—
Fujiyama, Kunio; Okamoto, Kei; and Yoshikawa, Noriyuki, 4,515,406, Cl. 297-409.000.
Okamoto, Kenzo: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 4,515,557, Cl. 431-302.000.
Okamoto, Norihiko: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Okamura, Kiyohito: *See*—
Yajima, Seishi, deceased; Noda, Akiko, heir; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamaura, Takemi, 4,515,742, Cl. 264-63.000.
Okamuro, James A., to Borroughs Tool & Equipment Corporation. Seal installation device with coaxial handle parts. 4,515,376, Cl. 277-9.500.
Okano, Shizuo, to Sanyo Electric Co., Ltd. Battery pack. 4,515,872, Cl. 429-65.000.
Okubo, Junpei, to Kabushiki Kaisha Komatsu Seisakusho. Inertia supercharger for internal combustion engines. 4,515,115, Cl. 123-52.00M.
Okudaira, Toshiyuki: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Olin Corporation: *See*—
Fair, David L.; Justice, David D.; and Kelly, Pilar P., 4,515,665, Cl. 204-98.000.
Polan, Ned W.; and Chao, Chung-Yao, 4,515,671, Cl. 204-228.000.
Shen, Ming, 4,515,958, Cl. 548-251.000.
Tyler, Derek E.; and Yarwood, John C., 4,515,630, Cl. 75-53.000.
Oliver, John E., Jr.; and Singer, Arnold M. Chemically cleaning drilling/completion/packer brines. 4,515,699, Cl. 252-8.55R.
Olmsted, Bruce E., to JSJ Corporation. Drop-in type shifter with displaced shift stick. 4,515,032, Cl. 74-473.00R.
Olson, Daniel R.; and O'Donnell, Timothy W., to General Electric Company. Polyfunctional acrylate monomers and polymers thereof useful as capacitor dielectrics. 4,515,931, Cl. 526-323.200.
Olson, Edwin G.: *See*—
Varallo, Thomas P.; Ervine, Albert W. G.; Duffy, Joseph J.; and Olson, Edwin G., 4,514,956, Cl. 53-148.000.
Olson, Marvin. Apparatus for converting flow of water into electrical power. 4,516,033, Cl. 290-54.000.
Olympus Optical Co., Ltd.: *See*—
Shirako, Hideo, 4,516,181, Cl. 300-132.000.
Ushikubo, Masao, 4,515,286, Cl. 220-314.000.
Omark Industries, Inc.: *See*—
Scott, Lewis A., 4,515,055, Cl. 83-835.000.
OMI International Corporation: *See*—
Strom, Alice M.; Herr, R. Wilbur; and Martin, Sylvia, 4,515,663, Cl. 204-44.200.
Omitsu, Takashi: *See*—
Frank, Andrew A.; and Omitsu, Takashi, 4,515,041, Cl. 74-866.000.
Omura, Ikuo; and Yamauchi, Junichi, to Kuraray Co., Ltd. Highly water-resistant adhesive. 4,515,930, Cl. 526-276.000.
Ono Seiko Co., Ltd.: *See*—
Kataoka, Takeshi; Aoki, Ryoichi; Matsui, Hisashi; and Matsumoto, Hiroshi, 4,515,024, Cl. 74-10.330.
Ono, Toshiro: *See*—
Yoshihara, Hideo; Ozawa, Akira; Sekimoto, Misao; and Ono, Toshiro, 4,515,876, Cl. 430-5.000.
Ono, Yukio: *See*—
Kitano, Seiichi; and Ono, Yukio, 4,515,256, Cl. 192-18.00R.
Oota, Hideaki: *See*—
Sawano, Kiyohito; Kouichi, Ryujiro; Oota, Hideaki; Takano, Masashi; and Moroe, Michio, 4,515,909, Cl. 523-102.000.
Ooue, Michio: *See*—
Wakui, Yoko; Hachino, Hiroaki; Sawahata, Mamoru; Soga, Tasao; Yasuda, Tomio; and Ooue, Michio, 4,516,149, Cl. 357-71.000.

Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,515,797, Cl. 514-349.000.
Opcon, Inc.: *See*—
Fischer, William H., 4,515,336, Cl. 248-288.300.
Oppama Kogyo Kabushiki Kaisha: *See*—
Enomoto, Kiyoshige; and Iwata, Masao, 4,515,140, Cl. 123-603.000.
Optimum Manufacturing Inc.: *See*—
Vanelli, Johnny, 4,515,556, Cl. 431-253.000.
Orda Industries Ltd.: *See*—
Hirshfeld, Uri, 4,515,373, Cl. 273-317.000.
Oregon Graduate Center for Study & Research: *See*—
Hauser, Frank M.; and Mal, Dipakranjan, 4,515,720, Cl. 260-351.100.
Orjala, Markku, to Valtion Teknillinen Tutkimuskeskus. Burner for pellets. 4,515,088, Cl. 110-110.000.
Orndorff, Karl B.: *See*—
Sherwood, Edward F.; Orndorff, Karl B.; and Dillon, Charles M., 4,514,946, Cl. 52-211.000.
Orofino, Thomas A.: *See*—
Broaddus, Wayne R.; Jaber, Khalil N.; and Orofino, Thomas A., 4,515,839, Cl. 428-17.000.
O'Rourke, David J.: *See*—
Adger, Brian M.; and O'Rourke, David J., 4,515,952, Cl. 546-329.000.
Ortho Pharmaceutical Corporation: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,515,893, Cl. 435-240.000.
Kung, Patrick C.; and Goldstein, Gideon, 4,515,894, Cl. 435-240.000.
Kung, Patrick C.; and Goldstein, Gideon, 4,515,895, Cl. 435-240.000.
Osako, Kyoichi: *See*—
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.
Osterhage, Thomas F.: *See*—
Kievit, David J.; and Osterhage, Thomas F., 4,515,595, Cl. 604-385.00A.
Ostermeier, Johann: *See*—
Dopfer, Peter; Ostermeier, Johann; and Schwerin, Siegfried, 4,515,639, Cl. 106-288.00Q.
Ostop, John A.: *See*—
Przybysz, John X.; and Ostop, John A., 4,514,898, Cl. 29-582.000.
Otani, Kozo; and Yamada, Yoshio, to Toyo Tire & Rubber Company, Limited. Polyetherpolyol derivative and process for preparing the same. 4,515,981, Cl. 560-50.000.
Otdel Fiziko-Tekhnicheskikh Problem Energetiki Uralskogo Nauchnogo Tsentra Akademi Nauk SSR: *See*—
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Ovcharov, Vladimir K.: *See*—
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Bhatti, Mohinder S., 4,515,611, Cl. 65-2.000.
Stotler, David V.; and Coffey, Fred S., 4,515,613, Cl. 65-4.400.
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Porter, Clyde R., 4,515,034, Cl. 74-501.00R.
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Pachmayr Gun Works, Inc.: *See*—
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Varga, Laszlo ; Krekacs, Sandor; Latorcai, Janos; Palfi, Zoltan; and Fledrich, Istvan, 4,514,911, Cl. 34-22.000.
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Armstrong, Thomas R., 4,516,216, Cl. 364-514.000.
Pardini, John A.; Brubaker, Robert C.; and Rusnak, John J., to United States of America, Energy. Sealing coupling. 4,515,750, Cl. 376-446.000.
Park, Dong-Sil; and Zabala, Robert J., to Electric Power Research Institute, Inc. Corrosion-resistant coated ferrous body. 4,515,865, Cl. 428-610.000.
Parker, Gary F., to Cooperheat. Heat treatment method and apparatus. 4,515,559, Cl. 432-10.000.
Parquet, Donald J.; Brown, Thomas R.; and Edwards, Eldon R., to J. I. Case Company. Stabilizer assembly. 4,515,520, Cl. 414-718.000.
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Parran, John J., Jr.; and Sakkab, Nabil Y., to Procter & Gamble Company, The. Oral compositions. 4,515,772, Cl. 424-57.000.
Parrott, George A., to Dresser Europe S.A. Mining machine. 4,515,409, Cl. 299-43.000.
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Pasques, Christian. Wheel truck and roller assembly. 4,515,379, Cl. 280-11.270.
Pataki, Endre: *See*—
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Patrick, James F.; Seligman, Peter; Tong, Yit C.; and Clark, Graeme M., to Commonwealth of Australia Secretary of Industry and Commerce, The. Speech processing method and apparatus. 4,515,158, Cl. 128-419.00R.
Patterson, John W., Jr.; and Pfister, Jurg R., to SYNTEX (U.S.A.) Inc. Allene containing arachidonic acid derivatives. 4,515,727, Cl. 260-413.000.
Patterson, Michael, to Kangol Magnet Limited. Adjustable vehicle seat belt anchorage. 4,515,395, Cl. 280-808.000.
Patzwahl, Hans-Jurgen, to KRONES AG Hermann Kronseder Maschinenfabrik. Device for removing air from filled bottles or other containers. 4,514,953, Cl. 53-52.000.

Paul E. Hawkinson Company: *See—*
Hawkinson, Raymond P., Jr.; and Newman, Dennis W., 4,516,068, Cl. 324-54.000.
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Pav, Josef: *See—*
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Pavan, Mario. Method for producing undulated dough products. 4,515,817, Cl. 426-106.000.
Payne, David N.; Sasaki, Issei; and Adams, Michael J., to National Research Development Corporation. Measurement of refractive index profile. 4,515,475, Cl. 356-73.100.
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Peco Controls Corporation: *See—*
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,514,954, Cl. 53-53.000.
Pedroso, Raul I.: *See—*
Hollinger, John D.; and Pedroso, Raul I., 4,515,274, Cl. 209-3.100.
Pehart, Paul. Pupillary distance measuring instrument. 4,514,906, Cl. 33-200.000.
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Pendergrass, John E.; and Melton, David T., to Kendall Company, The. Surgical sponge. 4,515,594, Cl. 604-384.000.
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Pentel Kabushiki Kaisha: *See—*
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La Fiandra, Carlo; and Mumola, Peter B., 4,516,062, Cl. 318-676.000.
Perkins, Frank M. Transmission. 4,515,026, Cl. 74-63.000.
Peroni, Peter A., to LaFrance Corporation. Stove damper handle. 4,514,877, Cl. 16-111.00R.
Perrine, Carol-Anne: *See—*
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Perry, John C. Rod bearing lubrication for two-cycle engines. 4,515,110, Cl. 123-41.370.
Perry, Philip D.: *See—*
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Perry, Thomas J.; and Khera, Muhammad I., to GTE Automatic Electric Inc. Remote data link controller having multiple data link handling capabilities. 4,516,237, Cl. 370-58.000.
Perry, Thomas J., to GTE Automatic Electric Inc. Digital span transmission circuit. 4,516,245, Cl. 375-17.000.
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Jones, Gary A., 4,516,008, Cl. 219-109.000.
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Petersen, Jorgen H.; Clausen, Peter J. M.; and Rasmussen, Hilmar O., to Danfoss A/S. Vapor burner for liquid fuel. 4,515,555, Cl. 431-208.000.
Peterson, Bruce R.: *See—*
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Petitjean, Donald L. Golf club swing training device. 4,515,368, Cl. 273-186.00A.
Petro Tool, Inc.: *See—*
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Petrolite Corporation: *See—*
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Petter, Helmut; Bildstein, Hubert; and Simader, Fritz, to Schwarzkopf Development Corporation. Rotating anode for X-ray tubes. 4,516,255, Cl. 378-143.000.
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Peynaud, Francois; Gosselin, Jean; Farcy, Andre ; and Grandvaux, Bernard, to Thomson-CSF. Acoustic positioning system. 4,516,226, Cl. 367-6.000.
Pfaff Industriemaschinen GmbH: *See—*
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Pfefferkorn, Dietmar: *See—*
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Pfizer Inc.: *See—*
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Phase One Products, Corp.: *See—*
Taylor, Charles E.; Gattiker, Anton; and Krantz, Gary B., 4,515,468, Cl. 355-27.000.
Phelps, Peter M. Slotted splash bars for gas liquid contact apparatus. 4,515,735, Cl. 261-111.000.
Phillipps, Gordon H.; Humber, David C.; Ewan, George B.; and Coomber, Barry A., to Glaxo Group Limited. 11α-Amino-androstanes. 4,515,786, Cl. 514-182.000.
Phillips, Dale R.: *See—*
Loy, Robert E.; Phillips, Dale R.; and Willis, Paul E., 4,515,234, Cl. 180-89.120.
Phillips, James P., to Motorola, Inc. Microwave receiver front end design. 4,516,270, Cl. 455-302.000.
Phillips, Michael J., to Boeing Company, The. Knife block guide. 4,515,051, Cl. 83-146.000.
Phillips Petroleum Company: *See—*
Hitzman, Donald O., 4,515,700, Cl. 252-8.55R.
Schuettenberg, Alexander D.; and Gragson, James T., 4,515,740, Cl. 264-50.000.
Photomeca S.A.: *See—*
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Photon Chroma, Inc.: *See—*
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Phy, William S., to Fairchild Camera & Instrument Corporation. Process for fabricating precision optical spacers for image sensor filters. 4,515,662, Cl. 204-15.000.
Piduch, Hans-Gunter: *See—*
Kwasnik, Hans-Jurgen; Piduch, Hans-Gunter; and Bruske, Heinz-Dieter, 4,515,660, Cl. 202-241.000.
Piepers, Harry C.; and van Poele, Gerard J., to Meco Equipment Engineers, B.V. Device for galvanically applying a metal coating. 4,515,670, Cl. 204-199.000.
Pierce, Rex G.: *See—*
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Pilat, John F.: *See—*
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Pillari, Joseph C.; and Willging, Arthur W., to Singer Company, The. Fault detection arrangement for relay switching system. 4,516,076, Cl. 324-418.000.
Pillis, Joseph W., to Frick Company. Variable liquid refrigerant injection port locator for screw compressor equipped with automatic variable volume ratio. 4,515,540, Cl. 418-97.000.
Pinede, Edourd; and Seidel, William J., to PKS/Communications, Inc. Convertible desk to wall mounted telephone set. 4,515,998, Cl. 179-146.00R.
Pioneer Photo Albums, Inc.: *See—*
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Pischinger, Franz; and Kreuter, Peter, to Fev Forschungsgesellschaft fur Energietechnik und ver Brennungsmotoren mbH. Arrangement for electromagnetically operated actuators. 4,515,343, Cl. 251-48.000.
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Scribner, Albert W., 4,516,209, Cl. 364-466.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. 4,5-Dimethyl-2-(2-methylthio)ethyl)-1,3-oxathiolane. 4,515,966, Cl. 549-30.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. Methyl(methylthioalkyl)-1,3-dithiolanes. 4,515,967, Cl. 549-39.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. Furyl and phenyl mercaptals and use thereof in augmenting or enhancing the aroma or taste of foodstuffs. 4,515,968, Cl. 549-39.000.
Pittler Machinenfabrik AG: *See—*
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PKS/Communications, Inc.: *See—*
Pinede, Edourd; and Seidel, William J., 4,515,998, Cl. 179-146.00R.
PKS-Engineering GmbH & Co. KG: *See—*
Janich, Hans-Jurgen, 4,515,686, Cl. 209-139.00A.
Plaquin, Bernard, to Vallourec. Method and apparatus for ensuring correct thread make-up of a pipejoint. 4,515,020, Cl. 73-761.000.

Platek, Gary F.; and Krug, Geoffrey P., to Eltech systems Corporation. Reticulate electrode and cell for recovery of metal ions. 4,515,672, Cl. 204-269.000.

Pleibel, William: *See—*
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Plessey Overseas Limited: *See—*
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Pletka, Hans-Dieter: *See—*
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Plotzker, Irene G., to Du Pont de Nemours, E. I., and Company. Protective garment or cover, composite semipermeable barrier fabric, and use in detoxification. 4,515,761, Cl. 423-240.000.

Plumadore, John D., to Photon Chroma, Inc. Inclined toner flow control system for developing an electrostatic latent image upon an electrophotographic film. 4,515,463, Cl. 355-10.000.

Plunkett, Luther C., Jr.: *See—*
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Plutsky, Sheldon, to Pioneer Photo Albums, Inc. Apparatus for storing, displaying and identifying photographs. 4,514,919, Cl. 40-159.000.

Pocanschi, Adrian. Damping installation for earthquake-endangered buildings. 4,514,942, Cl. 52-167.000.

Polan, Ned W.; and Chao, Chung-Yao, to Olin Corporation. Electrochemical treatment of copper for improving its bond strength. 4,515,671, Cl. 204-228.000.

Polydrain, Inc.: *See—*
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Pong, Richard G. S. Buoyant metering dispenser. 4,514,866, Cl. 4-228.000.

Pope, H. Maie' . Personal grooming device. 4,514,903, Cl. 30-49.000.

Popendiker, Kurt: *See—*
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Poundstone, Donald H.: *See—*
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PPG Industries, Inc.: *See—*
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Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See—*
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Preiner, Gerhard; and Muller, Johann, to Wacker-Chemie GmbH. Method for preparing asymmetrical disiloxanes. 4,515,976, Cl. 556-453.000.

Prentice Corporation: *See—*
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Prescott, Rochelle; and Leiner, Dennis C., to Dyonics, Inc. Optical system. 4,515,444, Cl. 350-413.000.

Prewett, Phillip D.; Jefferies, Derek K.; Pashley, Neil A.; and Cockhill, Thomas D., to Dublier Scientific Limited. Dispenser for ion source. 4,516,052, Cl. 313-546.000.

Prior, Herbert E. Sawhorse bracket. 4,515,243, Cl. 182-155.000.

Prisant, Simon, to Coinamatic Leasing Corporation. Mounting means for drop coin mechanism. 4,515,261, Cl. 194-1.00A.

Pritulsky, James, to AMP Incorporated. Pin receptacle intended for mounting in a circuit board. 4,515,422, Cl. 339-17.00C.

Procter & Gamble Company, The: *See—*
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Moeddel, Robert W., 4,515,705, Cl. 252-174.120.
Parran, John J., Jr.; and Sakkab, Nabil Y., 4,515,772, Cl. 424-57.000.

Prodan, Janos: *See—*
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Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, to GTE Laboratories Incorporated. Multi-electrode array for a beam mode fluorescent lamp. 4,516,057, Cl. 315-260.000.

Provost, Florent: *See—*
Jacquemin, Claude; Provost, Florent; and Seinera, Andre , 4,515,560, Cl. 432-80.000.

Pryor, Timothy R., to Diffracto Ltd. Electro-optical sensors with fiber optic bundles. 4,515,479, Cl. 356-375.000.

Przybysz, John X.; and Ostop, John A., to Westinghouse Electric Corp. Method of making a self protected thyristor. 4,514,898, Cl. 29-582.000.

Pudas, Roland: *See—*
Otterstedt, Jan-Erik A.; Jaras, Sven G.; Pudas, Roland; and Upson, Lawrence L., 4,515,903, Cl. 502-68.000.

Pugh, Stuart; Smith, Douglas G.; Lee, Chee M.; Parr, Leslie R.; Birkett, John N.; Stibbs, Richard G.; and Tai, Tet C., to University of Technology. Adjustable support for an optical or other instrument. 4,515,333, Cl. 248-122.000.

Pundak, Nachman; and Shtrikman, Shmuel, to Ricor Ltd. Passive automatic phase delay control of the displacer motion in pneumatically driven split cycle type cryocoolers. 4,514,987, Cl. 62-6.000.

Purzycki, Kenneth L.: *See—*
Chalk, Alan J.; and Purzycki, Kenneth L., 4,515,711, Cl. 252-522.00R.

Pyburn, John R., Jr.: *See—*
Gilbert, Jerry R.; Millikan, Robert C.; Wysowski, Charles H.; and Pyburn, John R., Jr., 4,515,518, Cl. 414-459.000.

QO Chemicals, Inc.: *See—*
Everett, George S., 4,515,935, Cl. 528-141.000.

Quadra Wheelchairs, Inc.: *See—*
Minnebraker, Jeffrey P., 4,515,383, Cl. 280-242.0WC.

Quan, Ronald, to Sony Corporation. Voltage controlled variable capacitor. 4,516,041, Cl. 307-494.000.

Quantum Corporation: *See—*
Moon, William G.; Moon, Ronald R.; Peterson, Bruce R.; and Westwood, Donald C., 4,516,177, Cl. 360-77.000.

Querens, Allan E.: *See—*
Rawls, Henry R.; Querens, Allan E.; and Zimmerman, Barbara F., 4,515,910, Cl. 523-115.000.

Quinn, James P.: *See—*
Armstead, Brian H.; and Quinn, James P., 4,515,821, Cl. 426-330.400.

Radeklau, Hans-Jurgen: *See—*
Muller, Rudolf; Radeklau, Hans-Jurgen; Dofke, Harald; and Krieger, Detlef, 4,515,483, Cl. 366-303.000.

Radovich, Albert F. Portable desk and briefcase. 4,515,493, Cl. 402-4.000.

Ranken, Paul F.; and Walter, Thomas J., to Ethyl Corporation. N Alkyl-4-(4-pyridinyl)isatoic anhydrides. 4,515,945, Cl. 544-94.000.

Rankin, Henry, Jr. Bird nesting habitat. 4,515,108, Cl. 119-45.00R.

Rao, S. Prabhakara; and Burkhalter, John F., to Halliburton Company. Hydrolytically stable polymers for use in oil field cementing methods and compositions. 4,515,635, Cl. 106-90.000.

Rask, Mark C. Electrically-powered expansion/contraction apparatus. 4,516,102, Cl. 335-267.000.

Rasmussen, Hilmar O.: *See—*
Petersen, Jorgen H.; Clausen, Peter J. M.; and Rasmussen, Hilmar O., 4,515,555, Cl. 431-208.000.

Rasshofer, Werner: *See—*
Fauss, Rudolf; Meiners, Hans J.; Rasshofer, Werner; and Meyborg, Holger, 4,515,923, Cl. 525-127.000.

Rathe, Robert A.; and Volkmann, Thomas J., to FMC Corporation. Extensible boom with manual section stored in base. 4,514,939, Cl. 52-118.000.

Rauf, Richard; Pav, Josef; and Scholl, Klaus, to Kleinewefers GmbH. Roll for use in calendars or the like. 4,514,887, Cl. 29-116.0AD.

Rawls, Henry R.; Querens, Allan E.; and Zimmerman, Barbara F. Interpolymeric resin for treatment of teeth. 4,515,910, Cl. 523-115.000.

Ray, Richard C., to AT&T Bell Laboratories. Power failure alarm circuit permitting orderly shutdown of microprocessor load. 4,516,214, Cl. 364-483.000.

Ray, Robert W.; and Pierce, Rex G., to Caterpillar Tractor Co. Method and apparatus for abrasively machining a workpiece. 4,514,934, Cl. 51-165.00R.

Raymond, Lambert L.: *See—*
Ringdahl, Mark G.; Raymond, Lambert L.; and Scherer, Richard J., 4,516,007, Cl. 219-10.55D.

RCA Corporation: *See—*
Bleacher, John N.; and Cushman, Barry M., 4,515,867, Cl. 428-204.000.
Crowley, Albert T., 4,516,084, Cl. 331-2.000.
DiMarco, Louis A., 4,515,830, Cl. 427-122.000.
Dion, Donald F.; and Cantella, Michael J., 4,516,167, Cl. 358-160.000.
Gurley, Thomas M., 4,516,150, Cl. 358-13.000.
Haferl, Peter E., 4,516,058, Cl. 315-370.000.
Hernqvist, Karl G., 4,515,569, Cl. 445-5.000.
Hicks, James E., 4,516,168, Cl. 358-190.000.
Hudson, Kenneth C., 4,516,024, Cl. 250-236.000.
Kirschner, Thomas F., 4,516,233, Cl. 369-79.000.
Krull, Donald K.; and Naimpally, Saiprasad V., 4,516,153, Cl. 358-31.000.
Michaelis, Theodore D., 4,516,231, Cl. 369-44.000.
Miller, Richard D., 4,516,036, Cl. 307-228.000.
Starner, Eugene R., 4,516,217, Cl. 364-717.000.
Tarzaiski, Richard J., 4,516,235, Cl. 369-116.000.
Truskalo, Walter, 4,516,169, Cl. 358-190.000.
van Raalte, John A.; and Riddle, George H. N., 4,516,232, Cl. 369-126.000.
Willis, Donald H., 4,516,152, Cl. 358-29.000.

Reap, James J., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,515,624, Cl. 71-92.000.

Rebsamen, Arthur: *See—*
Slavik, Walter; and Rebsamen, Arthur, 4,515,320, Cl. 242-18.0DD.
Reed, David J.: *See—*
Davis, Earl K.; Drye, James E.; and Reed, David J., 4,515,898, Cl. 501-15.000.
Reed, Michael R.; and Hoffman, Daniel E., to Petro Tool, Inc. Tool cable feeding system. 4,515,211, Cl. 166-77.000.
Reed, William R., Jr.: *See—*
Komanduri, Ranga; Ettinger, Robert H.; Casey, Morton P., Jr.; and Reed, William R., Jr., 4,515,047, Cl. 82-1.00C.
Reese, Eckart: *See—*
Kleiner, Frank; Kubens, Rolf; Reese, Eckart; and Wank, Joachim, 4,515,925, Cl. 525-439.000.
Regnier, Danielle: *See—*
Oudet, Claude; and Regnier, Danielle, 4,516,064, Cl. 318-696.000.
Rehman, William R.: *See—*
Cobbs, Walter H., Jr.; and Rehman, William R., 4,515,836, Cl. 427-425.000.
Reich, Fritz: *See—*
Thalmann, Alfred; and Reich, Fritz, 4,515,177, Cl. 137-318.000.
Reiffert, Werner; Peters, Dieter; and Wiendahl, Joachim, to Neuhaus, J. D. Pneumatic control valve. 4,515,183, Cl. 137-625.210.
Reimiller, Robert D.: *See—*
Miller, William I.; and Reimiller, Robert D., 4,515,480, Cl. 356-400.000.
Rekers, John W., to Milliken Research Corporation. Radiation-stable polyolefin compositions containing aromatic ketone compounds. 4,515,666, Cl. 204-159.200.
Rempel, Dieter: *See—*
Nouvertne, Werner; Serini, Volker; Neuray, Dieter; Binsack, Rudolf; Gehrke, Hans-Georg; Rempel, Dieter; and Krishnai, Sivara, 4,515,918, Cl. 524-504.000.
Renner, Alfred, to Ciba Geigy Corporation. Allyl or methallyl-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid imides and bisimides. 4,515,962, Cl. 548-435.000.
Rentzea, Costin; Spiegler, Wolfgang; and Jung, Johann, to BASF Aktiengesellschaft. Triazolyl ketone-oximes and triazolyl dioximes, their preparation and their use as plant growth regulators. 4,515,616, Cl. 71-76.000.
Renz, Walter: *See—*
Kaule, Wittich; Renz, Walter; and Stenzel, Gerhard, 4,516,031, Cl. 250-562.000.
Repligen Corporation: *See—*
Herlihy, Walter C., 4,515,773, Cl. 424-59.000.
Research Association For Residual Oil Processing: *See—*
Shioiri, Tomonori; and Ino, Takashi, 4,515,902, Cl. 502-64.000.
Resonant Technology Company: *See—*
Gurries, Raymond A., 4,515,408, Cl. 299-37.000.
Rexnord, Inc.: *See—*
Roeder, Charles L.; Siefert, William J.; and Theijsmeijer, Frederik, 4,515,832, Cl. 427-233.000.
Rey-Bellet, Gerald: *See—*
Kompis, Ivan; Rey-Bellet, Gerald; and Zanetti, Guido, 4,515,948, Cl. 544-325.000.
Reynolds, Joseph D.; and Davis, Alan R., to Eaton Corporation. Compound variable mechanical advantage shifting mechanism. 4,515,029, Cl. 74-339.000.
Reynolds Metals Company: *See—*
Lee, Harry W., Jr.; and Wallace, Joseph W., 4,515,284, Cl. 220-70.000.
Reznik, David. Apparatus for cracking and separating nuts. 4,515,076, Cl. 99-571.000.
Rhoads, Paul M.; and Cheffer, Harold H., to NCR Corporation. Phase synchronization and control circuit. 4,516,035, Cl. 307-66.000.
Rhone-Poulenc Agrochimie: *See—*
Debourge, Jean-Claude; and Lacroix, Guy, 4,515,807, Cl. 514-513.000.
Ribaudo, Andrew, Jr. Hot water control system. 4,515,307, Cl. 236-25.00R.
Richardson-Vicks Inc.: *See—*
Bogardus, Rodger E.; Packer, Jon D.; and SaNogueira, Peter, 4,515,784, Cl. 514-63.000.
Richert, Gerald R.: *See—*
Mills, George A.; and Richert, Gerald R., 4,515,275, Cl. 209-558.000.
Richert, Manfred: *See—*
Emert, Anton; Knabel, Walter; and Richert, Manfred, 4,515,388, Cl. 280-605.000.
Ricoh Company, Ltd.: *See—*
Kammoto, Yoshiaki, 4,516,174, Cl. 358-282.000.
Sakurai, Akira, 4,516,262, Cl. 382-18.000.
Sasaki, Masaomi, 4,515,883, Cl. 430-58.000.
Suzuki, Kohji, 4,515,467, Cl. 355-15.000.
Yano, Takashi, 4,516,272, Cl. 455-607.000.
Ricor Ltd.: *See—*
Pundak, Nachman; and Shtrikman, Shmuel, 4,514,987, Cl. 62-6.000.
Riddle, George H. N.: *See—*
van Raalte, John A.; and Riddle, George H. N., 4,516,232, Cl. 369-126.000.
Rieker, Werner: *See—*
Schadlich, Fritz; Rieker, Werner; Thaler, Rainer; and Klingenstein, Klaus, 4,515,303, Cl. 227-131.000.
Riggan, William C., to United States of America, Energy. Pulse flux measuring device. 4,516,028, Cl. 250-370.000.
Rinehart, John R. Taxidermy mannikin mold with recesses for supporting artificial eyes. 4,515,340, Cl. 249-96.000.

Rinehart, Larry F.: *See—*
Fenneman, David B.; Rinehart, Larry F.; and Hardesty, Leonard W., Jr., 4,516,077, Cl. 324-425.000.
Ringdahl, Mark G.; Raymond, Lambert L.; and Scherer, Richard J., to Litton Systems, Inc. Interlock switch module for a microwave oven. 4,516,007, Cl. 219-10.55D.
Rippstein, Robert P.: *See—*
Boehm, Russell W.; Rippstein, Robert P.; and Stone, David R., 4,515,544, Cl. 425-129.00R.
Riseberg, Leslie A.: *See—*
Proud, Joseph M.; Riseberg, Leslie A.; Byszewski, Wojciech W.; and Budinger, A. Bowman, 4,516,057, Cl. 315-260.000.
Ritch, Curtis R.: *See—*
Sewell, James H.; Gaede, Hans; and Ritch, Curtis R., 4,515,299, Cl. 223-76.000.
Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Boron alkyl compounds and processes for their manufacture and use. 4,515,724, Cl. 260-410.000.
Robert Bosch GmbH: *See—*
Bolle, Gunter; Bragas, Peter; and Eschke, Bernd, 4,515,994, Cl. 179-2.00R.
Borst, Erich; Schadlich, Fritz; and Stabler, Manfred, 4,516,045, Cl. 310-68.00E.
Buck, Rainer; Kull, Hermann; Piwonka, Fridolin; Sieber, Albrecht; Stumpp, Gerhard; and Wessel, Wolf, 4,515,125, Cl. 123-359.000.
Jaggle, Gunther; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schutz, Rudolf, 4,515,128, Cl. 123-454.000.
Nolting, Peter; and Bleger, Claude, 4,516,106, Cl. 338-28.000.
Schadlich, Fritz; Rieker, Werner; Thaler, Rainer; and Klingenstein, Klaus, 4,515,303, Cl. 227-131.000.
Sumal, Jaihind S., 4,515,014, Cl. 73-202.000.
Roberts, Jon A.: *See—*
Brownell, David J.; and Roberts, Jon A., 4,515,668, Cl. 204-192.00D.
Roberts, Mark G.: *See—*
Mouser, Curtis A.; Roberts, Mark G.; Haas, Daniel R.; and Lancaster, Patrick R., III, 4,514,955, Cl. 53-64.000.
Roberts, Richard D.; Franz, James H., Jr.; Hoffman, Lester J.; and Miller, Lalan G., to Westinghouse Electric Corp. Motor control chopper apparatus phase angle limiting. 4,516,059, Cl. 318-301.000.
Robertson, David W., to Eli Lilly and Company. Certain naphthalenyl imidazo compounds and their pharmaceutical use. 4,515,796, Cl. 514-303.000.
Robertson, Michael A.: *See—*
Warren, Robert G.; and Robertson, Michael A., 4,516,201, Cl. 364-200.000.
Robilliard, Leonard T.; and Hewitt, Alan R. Framework connection means. 4,515,494, Cl. 403-187.000.
Robot Research, Inc.: *See—*
Stahler, John P., 4,516,151, Cl. 358-14.000.
Robvon Backing Ring Company: *See—*
von Ahrens, Roger W., 4,515,000, Cl. 72-278.000.
Rock, Howard P.; and Rock, Kelly P. Fuel efficient, low pollution carburetor and methods. 4,515,734, Cl. 261-50.00R.
Rock, Kelly P.: *See—*
Rock, Howard P.; and Rock, Kelly P., 4,515,734, Cl. 261-50.00R.
Rockefeller University, The: *See—*
Erickson, Bruce W., 4,515,920, Cl. 525-54.110.
Rockford Enterprises, Inc.: *See—*
Salmon, Dennis E., 4,515,245, Cl. 184-105.00R.
Rockwell International Corporation: *See—*
Bruene, Warren B., 4,516,087, Cl. 332-17.000.
Christoff, William J., 4,514,976, Cl. 60-39.070.
Holmes, Dale A., 4,516,244, Cl. 372-99.000.
Mosier, Donald E., 4,515,440, Cl. 350-334.000.
Nelson, David A., 4,516,055, Cl. 315-151.000.
Rockwood, Albert M. Folding net mechanism. 4,514,925, Cl. 43-12.000.
Rodekamp, Hartmut: *See—*
Euscher-Klingenhagen, Werner; Griemla, Horst; and Rodekamp, Hartmut, 4,515,285, Cl. 220-288.000.
Roeder, Charles L.; Siefert, William J.; and Theijsmeijer, Frederik, to Rexnord, Inc. Method for coating the inside of pipe. 4,515,832, Cl. 427-233.000.
Rogen, Neil E.; and Adnyana, Dewa N., to Memory Metals, Inc. Packing tool apparatus for sealing well bores. 4,515,213, Cl. 166-123.000.
Rogers Corporation: *See—*
Harper, William P., 4,515,999, Cl. 200-5.00A.
Maine, Richard L., 4,515,739, Cl. 264-45.300.
Rohm GmbH: *See—*
Kolbe, Klaus; Hellmann, Walter; Krajec, Otmar; Schikowsky, Hartmut; and Vetter, Heinz, 4,515,648, Cl. 156-196.000.
Rohm and Haas Company: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,515,988, Cl. 568-586.000.
Kuhn, Robert R.; Whiteman, John D.; and Brendley, William H., Jr., 4,515,835, Cl. 427-388.300.
Rohrbach, Peter H., to SI Handling Systems, Inc. Speed control apparatus. 4,515,085, Cl. 104-250.000.
Roman, Frank. Fuel economizing device. 4,515,133, Cl. 123-538.000.
Romer, Dietmar, to Sandoz Ltd. Analgesic preparations. 4,515,802, Cl. 514-288.000.
Rontgen Technische Dienst B.V.: *See—*
Wapperom, Pieter, 4,516,256, Cl. 378-60.000.
Rood, Robert M.; and Wulfing, James J., to Minnesota Mining and Manufacturing Company. Tape spool. 4,515,323, Cl. 242-74.100.

Rood, Robert M.: *See*—
Wulfing, James J.; and Rood, Robert M., 4,515,330, Cl. 242-197.000.

Roper Corporation: *See*—
Dankel, Douglas D., 4,515,194, Cl. 144-193.00A.
Scanland, Joseph E.; and Skillman, David B., 4,514,967, Cl. 56-14.700.

Rosenberg, Michael A., to SFE Technologies. Leadless filter component. 4,516,092, Cl. 333-184.000.

Roser, Erich. Swash ring driven diaphragm pump. 4,515,531, Cl. 417-269.000.

Rossignol S.A.: *See*—
Boy-Marcotte, Jean L. M. R.; Chastang, Georges J.; Salvaire, Laurent O.; and Burnouf, Christian D., 4,515,148, Cl. 126-438.000.

Rossing, Martin A.: *See*—
McDonald, Ray S.; Thompson, David L.; Rossing, Martin A.; and Hartlaub, Jerome T., 4,515,159, Cl. 128-419.0PG.

Rost, David P.: *See*—
Schwab, Carl E.; Rost, David P.; Hackenberg, William; and Holcombe, Paul, 4,516,125, Cl. 343-7.700.

Rotabo Industries Inc.: *See*—
Bolwig, Rolf W., 4,516,192, Cl. 362-107.000.

Rotella, Thomas B. Compact exercise device. 4,515,364, Cl. 272-143.000.

Rother, Bruno; and Trommen, Hartmut, to G.A. Pfleiderer GmbH & Co. KG. Apparatus for the manufacture of conical hollow poles of fiber reinforced synthetic resin. 4,515,547, Cl. 425-215.000.

Roussel Uclaf: *See*—
Teutsch, Jean G.; Deraedt, Roger; and Benzoni, Josette, 4,515,787, Cl. 514-180.000.

Rovin, Herman. Drapery pleat hemming method. 4,515,097, Cl. 112-262.300.

Rozek, Rafl: *See*—
Bany, Peter-Michael; Berger, Wolfgang; Bettge, Hans; Bialkowski, Gunter; Rozek, Rafl; Steinemer, Norbert; and Volkmann, Claus-Jurgen, 4,516,004, Cl. 200-144.00B.

Rozman, George J.: *See*—
Hettinger, William P., Jr.; Turrill, Frank H.; Rozman, George J.; and Beck, H. Wayne, 4,515,680, Cl. 208-87.000.

Rubinstein, Randall B., to Hottinger Baldwin Measurements, Inc. Platform transducer beams. 4,515,232, Cl. 177-154.000.

Rudolf, Peter: *See*—
Gehrung, Manfred; Schoettle, Klaus; Kreissler, Helmut; Rudolf, Peter; Hack, Joachim; and Anslinger, Friedrich, 4,514,937, Cl. 51-281.0SF.

Rudolph nee Otten, Anna G., heir: *See*—
Meininger, Fritz; Otten, Joachim W., deceased; Otten, Ursula, heir; and Rudolph nee Otten, Anna G., heir, 4,515,598, Cl. 8-549.000.

Ruhenstroth-Bauer, Gerhard: *See*—
Valet, Gunter; Ruhenstroth-Bauer, Gerhard; Wunsch, Erich; and Moroder, Luis, 4,515,730, Cl. 260-465.00D.

Ruhrchemie Aktiengesellschaft: *See*—
Bernhagen, Wolfgang; Falk, Volker; Springer, Helmut; Weber, Jurgen; Wiebus, Ernst; and Kniep, Claus, 4,515,986, Cl. 564-471.000.

Rusch, Reinhard: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; and Rusch, Reinhard, 4,515,619, Cl. 71-90.000.

Ruskin Manufacturing Company: *See*—
Van Becelaere, Robert M., 4,515,068, Cl. 98-1.000.

Rusnak, John J.: *See*—
Pardini, John A.; Brubaker, Robert C.; and Rusnak, John J., 4,515,750, Cl. 376-446.000.

Russo, Carl J., to Varian Associates, Inc. Ion chamber for electron-bombardment ion sources. 4,516,050, Cl. 313-359.100.

Russo, Cheryl L.: *See*—
Gimpelson, George E.; and Russo, Cheryl L., 4,515,652, Cl. 156-643.000.

Ryberg, Bertil; and Mellgren, Kenth, to Aktiebolaget Volvo Penta. Starter switch arrangement. 4,516,000, Cl. 200-44.000.

Rybka, Bruno: *See*—
Borchard, Heinz; Knothe, Herbert; and Rybka, Bruno, 4,515,843, Cl. 428-64.000.

S.A.R.L Centre d'Etude et de Realisation d'Equipment et de Materiel C.E.R.E.M.: *See*—
Sirand, Joseph, 4,515,554, Cl. 431-78.000.

S&S Corrugated Paper Machinery Co., Inc.: *See*—
Flaum, Stephen S., 4,515,052, Cl. 83-479.000.

Sa af, Lars L.; and Bergsten, Lars E., to Saab-Scania Aktiebolag. Arrangement for ignition means in a multi-cylinder internal combustion engine. 4,515,141, Cl. 123-647.000.

Saab-Scania Aktiebolag: *See*—
Sa af, Lars L.; and Bergsten, Lars E., 4,515,141, Cl. 123-647.000.

Sabins, Fred: *See*—
Childs, Jerry; Sabins, Fred; and Taylor, Mary J., 4,515,216, Cl. 166-293.000.

Sack, Werner; and Kiefer, Werner, to Schott Glaswerke. Crystallizing glass solders and stripping films with such glass solder imprinted thereon. 4,515,897, Cl. 501-15.000.

Safety Devices (Engineering) Limited: *See*—
White, Iain S., 4,516,116, Cl. 340-685.000.

St. Ledger, Joseph B., to Outboard Marine Corporation. Low moisture sensitive ignition. 4,515,139, Cl. 123-599.000.

St. Luke's Hospital: *See*—
Dougherty, Delford O., 4,515,295, Cl. 222-113.000.

St. Regis Corporation: *See*—
Myers, Richard A., 4,515,266, Cl. 206-205.000.

Saito, Takao: *See*—
Moriyama, Masakazu; and Saito, Takao, 4,516,207, Cl. 364-424.000.

Sakai, Kazuo: *See*—
Utaka, Katsuyuki; Sakai, Kazuo; and Akiba, Shigeyuki, 4,516,243, Cl. 372-96.000.

Sakai, Koichi: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 4,515,557, Cl. 431-302.000.

Sakai, Toshiyasu: *See*—
Hara, Masahiro; Okamoto, Atsutoshi; and Sakai, Toshiyasu, 4,516,017, Cl. 235-472.000.

Sakakibara, Hideo: *See*—
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,515,941, Cl. 536-7.100.

Sakakibara, Mitsuhiko; Yoshizawa, Masao; Ogawa, Masaki; Hirata, Yasushi; and Tomihira. Shigeru, to Bridgestone Tire Company Limited; and Japan Synthetic Rubber Co., Ltd. Rubber compositions. 4,515,922, Cl. 525-99.000.

Sakakiyama, Ryuzo: *See*—
Takano, Toshio; and Sakakiyama, Ryuzo, 4,515,257, Cl. 192-0.075.

Sakamoto, Junichi: *See*—
Horikoshi, Hiroshi; Arai, Akio; Tsukagoshi, Sadayuki; and Sakamoto, Junichi, 4,515,365, Cl. 273-25.000.

Sakata, Yoshiya: *See*—
Shiba, Haruo; Sakata, Yoshiya; and Tanaka, Kimio, 4,515,322, Cl. 242-71.800.

Sakkab, Nabil Y.: *See*—
Parran, John J., Jr.; and Sakkab, Nabil Y., 4,515,772, Cl. 424-57.000.

Sakura, Yasuhiro; Nakajima, Yasushi; Tajima, Noriyasu; and Nimura, Hitoshi, to Tokyo Electric Co. Ltd. Label issuing apparatus with programmable label feed. 4,516,208, Cl. 364-466.000.

Sakurai, Akira, to Ricoh Company, Ltd. Character data processing apparatus. 4,516,262, Cl. 382-18.000.

Sakurai, Masaki: *See*—
Sigiyama, Hiroyuki; Sakurai, Masaki; Abe , Ryozo; and Yoshihara, Kenji, 4,516,161, Cl. 358-342.000.

Sakurai, Toshihiro, to Yamaichi Electric Mfg. Co., Ltd. Support structure for IC package and having removable closure. 4,515,424, Cl. 339-75.0MP.

Sakurai, Yoshifumi; and Numata, Takuhisa, to Kureha Kagaku Kogyo Kabushiki Kaisha. Laminated magnetic bubble device. 4,516,222, Cl. 365-32.000.

Sakurai, Yukio; and Yamamoto, Akihiko, to Nissan Motor Company, Limited. Air conditioning system. 4,515,208, Cl. 165-43.000.

Sakuyama, Masao, to Citizen Watch Company Limited. Display device. 4,516,120, Cl. 340-785.000.

Sallee, Dennis C.: *See*—
Knepper, J. Irvine; and Sallee, Dennis C., 4,515,603, Cl. 44-62.000.

Salmon, Dennis E., to Rockford Enterprises, Inc. Oil filler extension. 4,515,245, Cl. 184-105.00R.

Saltzman, Leonard F. Bow and arrow sighting device. 4,514,907, Cl. 33-265.000.

Salvadori, Bruno, to Societa Pneumatici Pirelli. Devices for vulcanizing tires. 4,515,541, Cl. 425-47.000.

Salvaire, Laurent O.: *See*—
Boy-Marcotte, Jean L. M. R.; Chastang, Georges J.; Salvaire, Laurent O.; and Burnouf, Christian D., 4,515,148. Cl. 126-438.000.

Sanchez, Fernando J.: *See*—
Winter-Moore, Peter H.; and Sanchez, Fernando J., 4,515,565, Cl. 433-221.000.

Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., to Eastman Kodak Company. Cyanoalkylpiperazines and methods for their preparation and use. 4,515,947, Cl. 544-295.000.

Sanders, Royden C., Jr.; and Forsyth, John L., to Sanders, Royden C., Jr. Assembling dot matrix print heads. 4,515,488, Cl. 400-124.000.

Sandoz Ltd.: *See*—
Brich, Zdenek; and Muhle, Herbert, 4,515,950, Cl. 546-67.000.
Romer, Dietmar, 4,515,802, Cl. 514-288.000.

Sandvik, Johannes, to Elkem a/s. Feed device for guiding a rope onto a winding drum. 4,515,329, Cl. 242-157.100.

Sanford, Robert A.: *See*—
Cantrell, Daniel V.; and Sanford, Robert A., 4,515,170, Cl. 131-336.000.

Sanofi: *See*—
Boigegrain, Robert; Maffrand, Jean-Pierre; Suzuki, Norio; Matsubayachi, Kynichi; and Ashida, Shinichiro, 4,515,951, Cl. 546-114.000.

SaNogueira, Peter: *See*—
Bogardus, Rodger E.; Packer, Jon D.; and SaNogueira, Peter, 4,515,784, Cl. 514-63.000.

Santroch, George; and Jirkovsky, Ivo, to American Home Products Corporation. [2-(1H-indol-1-yl)ethyl]-2-piperazine and pyrido[1,2-a]indol-9-one as intermediates for pyrazino(2,3-3,4)pyrido(1,2-a) indoles which are useful for treating hypertension in mammals. 4,515,949, Cl. 544-343.000.

Sanyo Electric Co., Ltd.: *See*—
Okano, Shizuo, 4,515,872, Cl. 429-65.000.

Sasaki, Issei: *See*—
Payne, David N.; Sasaki, Issei; and Adams, Michael J., 4,515,475. Cl. 356-73.100.

Sasaki, Masaomi, to Ricoh Company, Ltd. Stilbene derivatives, distyryl derivatives and electrophotographic photoconductor comprising at least one of the derivatives. 4,515,883, Cl. 430-58.000.

Sasaki, Osamu: *See*—
Sawada, Kiyoshi; Goto, Satoshi; Kinoshita, Akira; and Sasaki, Osamu, 4,515,881, Cl. 430-58.000.

Sasaki, Sadayuki: *See*—
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,515,352, Cl. 266-218.000.

Sasser, Bill H., to Motorola, Inc. Low RCS RF switch and phase shifter using such a switch. 4,516,091, Cl. 333-161.000.

Satake Engineering Co. Ltd.: *See*—
Satake, Toshihiko, 4,515,075, Cl. 99-519.000.

Satake, Toshihiko, to Satake Engineering Co. Ltd. Rice polishing machine. 4,515,075, Cl. 99-519.000.

Satellite Business Systems: *See*—
Fabris, Alfonso V.; Strickland, Robert M., Jr.; and Toth, John T., 4,516,156, Cl. 358-85.000.

Sato, Kunihiko: *See*—
Suzuki, Yukio; Sato, Kunihiko; and Muramatsu, Motoyasu, 4,515,131, Cl. 123-491.000.

Sato, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Dual type antilock braking device for four-wheeled vehicles. 4,515,412, Cl. 303-6.00R.

Sato, Masaaki: *See*—
Adachi, Kiyoshi; Uehara, Masaru; Kitagawa, Hiroshi; Kojima, Hirotaka; and Sato, Masaaki, 4,514,965, Cl. 53-553.000.

Sato, Mituo: *See*—
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; and Yoshida, Toshihiro, 4,516,180, Cl. 360-126.000.

Sato, Naoki: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.

Sauer, Anton; and Thinschmidt, Hans, to Siemens Aktiengesellschaft. Optical passive bus control system. 4,516,204, Cl. 364-200.000.

Sauer, Gale E.: *See*—
Menchetti, Robert J.; and Sauer, Gale E., 4,514,945, Cl. 52-202.000.

Sauter, Gary E. Neon lighted roll bar. 4,515,393, Cl. 280-756.000.

Savonjousi, Aslak, to Kymi-Stromberg Oy. Method for controlling a piston fed wood grinder. 4,515,318, Cl. 241-28.000.

Sawada, Kiyoshi; Goto, Satoshi; Kinoshita, Akira; and Sasaki, Osamu, to Konishiroku Photo Industry Co., Ltd. Electrophotographic bisazo photosensitive member. 4,515,881, Cl. 430-58.000.

Sawahata, Mamoru: *See*—
Wakui, Yoko; Hachino, Hiroaki; Sawahata, Mamoru; Soga, Tasao; Yasuda, Tomio; and Ooue, Michio, 4,516,149, Cl. 357-71.000.

Sawano, Kiyohito; Kouichi, Ryujiro; Oota, Hideaki; Takano, Masashi; and Moroe, Michio. Resinous composition for the prolonged release of fragrant substances. 4,515,909, Cl. 523-102.000.

Sawatani, Tadashi; Ishii, Mitsuo; Yoshimura, Hirofumi; and Harase, Jirou, to Nippon Steel Corporation. Method for producing ferritic stainless steel sheets or strips containing aluminum. 4,515,644, Cl. 148-12.0EA.

Sayles, David C., to United States of America, Army. Cure shrink-resistant missile motor cases. 4,515,912, Cl. 523-456.000.

Scanland, Joseph E.; and Skillman, David B., to Roper Corporation. Bridge support for securing sulky to walk-behind mower. 4,514,967, Cl. 56-14.700.

Schadewald, Frederic H., to Upjohn Company, The. Sterile suspension and solution holding and mixing tank. 4,515,482, Cl. 366-136.000.

Schadlich, Fritz; Rieker, Werner; Thaler, Rainer; and Klingenstein, Klaus, to Robert Bosch GmbH. Electric hammering apparatus with air-cushioned armature. 4,515,303, Cl. 227-131.000.

Schadlich, Fritz: *See*—
Borst, Erich; Schadlich, Fritz; and Stabler, Manfred, 4,516,045, Cl. 310-68.00E.

Schaefer, Ernst H., to Westvaco Corporation. Method of bleaching paper pulp by blending chlorine with a flow volume of paper pulp slurry. 4,515,655, Cl. 162-57.000.

Schafer, Paul: *See*—
Guth, Christian; and Schafer, Paul, 4,515,597, Cl. 8-107.000.

Schaffer, Norbert: *See*—
Stumpfi, Werner; Bettinger, Gunter; Engel, Friedrich; Fitterer, Horst; Kreimes, Norbert; Pfefferkorn, Dietmar; Schaffer, Norbert; and Schmidts, Kurt, 4,515,331, Cl. 242-199.000.

Scharfe, Merlin E.: *See*—
Mammino, Joseph; Sypula, Donald S.; Abramsohn, Dennis A.; Abkowitz, Martin A.; and Scharfe, Merlin E., 4,515,882, Cl. 430-58.000.

Scharfy, Madelon L. Culinary utensil support. 4,515,332, Cl. 248-37.300.

Schaub, Robert E.; Miner, Thomas G.; and Bernstein, Seymour, to American Cyanamid Company. Substituted phenyl-1-thio(poly-O-sulfo)-α(or β)-D-glucopyranosides. 4,515,782, Cl. 514-24.000.

Schaumburg, Edward G.; and Stanefski, Eugene F., to GNB Batteries Inc. Compound dispensing method and apparatus. 4,515,187, Cl. 141-1.000.

Scheckel, Bruno; and Wittenzellner, Ernst, to Siemens Aktiengesellschaft. Digital tone generator for tone sequences. 4,516,113, Cl. 340-384.00E.

Scher, Herbert B.: *See*—
Fancher, Llewellyn W.; and Scher, Herbert B., 4,515,813, Cl. 514-563.000.

Scherer, Richard J.: *See*—
Ringdahl, Mark G.; Raymond, Lambert L.; and Scherer, Richard J., 4,516,007, Cl. 219-10.55D.

Schering Aktiengesellschaft: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; and Rusch, Reinhard, 4,515,619, Cl. 71-90.000.
Muller, Rudolf; Radeklau, Hans-Jurgen; Dofke, Harald; and Krieger, Detlef, 4,515,483, Cl. 366-303.000.

Schiff, Peter, to SMEC, Inc. IAB having apparatus for assuring proper balloon inflation and deflation. 4,515,587, Cl. 604-96.000.

Schikowsky, Hartmut: *See*—
Kolbe, Klaus; Hellmann, Walter; Krajec, Otmar; Schikowsky, Hartmut; and Vetter, Heinz, 4,515,648, Cl. 156-196.000.

Schimmelpfennig, Wolfgang; and Siede, Heinz-Jurgen, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Infrared detector. 4,516,027, Cl. 250-338.000.

Schleffendorf, John J. Weight lifting exerciser. 4,515,363, Cl. 272-118.000.

Schlegel Corporation: *See*—
Annis, Gerald A., 4,515,845, Cl. 428-86.000.

Schlueter, Klaus. Method of removing plastic residues in mixing apparatuses and molding tools. 4,515,091, Cl. 110-346.000.

Schmanski, Donald W., to Carsonite International Corporation. Electrolysis test station terminal and support. 4,516,069, Cl. 324-71.100.

Schmid, Hans-Dieter: *See*—
Haubner, Georg; and Schmid, Hans-Dieter, 4,515,118, Cl. 123-149.00C.

Schmidt, Bernhard, to Felten & Guilleaume Carlswerk Aktiengesellschaft. Coupling arrangement for optical waveguides and method of manufacturing the same. 4,515,433, Cl. 350-96.210.

Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical Co. 5′/6′-Carboxyfluorans and derivatives thereof. 4,515,971, Cl. 549-225.000.

Schmidts, Kurt: *See*—
Stumpfi, Werner; Bettinger, Gunter; Engel, Friedrich; Fitterer, Horst; Kreimes, Norbert; Pfefferkorn, Dietmar; Schaffer, Norbert; and Schmidts, Kurt, 4,515,331, Cl. 242-199.000.

Schmieder, Klaus: *See*—
Lechtken, Peter; Mueller, Gerhard; and Schmieder, Klaus, 4,515,982, Cl. 560-125.000.

Schnall, Gunther: *See*—
Mullritter, Ludwig; Schnall, Gunther; and Fruth, Franz, 4,515,356, Cl. 270-53.000.

Schneider, Marshall, to Hallmark Cards, Inc. Combination easel hinge and hanging device. 4,515,338, Cl. 248-460.000.

Schoenig, Frederick C., Jr.; and Landry, James D., to General Electric Company. Subcriticality measurement apparatus and method. 4,515,749, Cl. 376-254.000.

Schoenthaler, David; and Wojcik, Thaddeus, to AT&T Technologies, Inc. Methods for multipoint dispensing of viscous material. 4,515,297, Cl. 222-160.000.

Schoettle, Klaus: *See*—
Gehrung, Manfred; Schoettle, Klaus; Kreissler, Helmut; Rudolf, Peter; Hack, Joachim; and Anslinger, Friedrich, 4,514,937, Cl. 51-281.0SF.

Scholkens, Bernward: *See*—
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,515,803, Cl. 514-338.000.

Scholl, Klaus: *See*—
Rauf, Richard; Pav, Josef; and Scholl, Klaus, 4,514,887, Cl. 29-116.0AD.

Schoop, Gunther-Dietmar: *See*—
Trumper, Thomas; Schoop, Gunther-Dietmar; Borgschulte, Fritz; and Krummnack, Friedrich, 4,515,410, Cl. 299-43.000.

Schorr, Steven M.; and Stoner, Richard J., Jr., to Genisis Technology, Inc. Method and apparatus for aeroponic propagation of plants. 4,514,930, Cl. 47-60.000.

Schott Glaswerke: *See*—
Sack, Werner; and Kiefer, Werner, 4,515,897, Cl. 501-15.000.

Schrock, Wilfried: *See*—
Metzger, Karl G.; Schrock, Wilfried; Habich, Dieter; Naab, Paul; and Zeiler, Hans-Joachim, 4,515,789, Cl. 514-196.000.

Schuck, Howard L. Hitch with swiveling tongue. 4,515,387, Cl. 280-478.00A.

Schuettenberg, Alexander D.; and Gragson, James T., to Phillips Petroleum Company. Method of forming solid form fuel additives. 4,515,740, Cl. 264-50.000.

Schulte & Lestraden B.V.: *See*—
Lestraden, Jacobus W., 4,514,929, Cl. 47-17.000.

Schumacher, Karl, to Ernst Wagner KG-Fordertechnik. Vehicle with two steerable wheels. 4,515,380, Cl. 280-93.000.

Schutten, Herman P.: *See*—
Jaskolski, Stanley V.; Schutten, Herman P.; Spellman, Gordon B.; Sedivy, Jan K.; and Jensen, Maurice W., 4,516,144, Cl. 357-27.000.

Schutz, Rudolf: *See*—
Jaggle, Gunther; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schutz, Rudolf, 4,515,128, Cl. 123-454.000.

Schwab, Carl E.; Rost, David P.; Hackenberg, William; and Holcombe, Paul, to General Signal Corporation. Method and apparatus for monitoring vehicle ground movement in the vicinity of an airport. 4,516,125, Cl. 343-7.700.

Schwab, Michael: *See*—
Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Muhlhofer, Ernst; and Schwab, Michael, 4,515,762, Cl. 423-337.000.

Schwartz, Bertram: *See—*
Dixon, Richard W.; Joyce, William B.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,514,896, Cl. 29-576.00B.
Schwarz, Jurgen: *See—*
Muller, Gerhard; and Schwarz, Jurgen, 4,515,445, Cl. 350-524.000.
Schwarz, Richard A., to PPG Industries, Inc. Organic peroxide composition containing trihydric alcohol, alkali or alkaline earth metal chloride, or monosaccharide. 4,515,928, Cl. 526-200.000.
Schwarzkopf Development Corporation: *See—*
Petter, Helmut; Bildstein, Hubert; and Simader, Fritz, 4,516,255, Cl. 378-143.000.
Schwerin, Siegfried: *See—*
Dopfer, Peter; Ostermeier, Johann; and Schwerin, Siegfried, 4,515,639, Cl. 106-288.00Q.
Scientific Laboratories, Inc.: *See—*
Miller, Lowell A., 4,515,550, Cl. 425-392.000.
Scott, Lewis A., to Omark Industries, Inc. Circular saw blade. 4,515,055, Cl. 83-835.000.
Scribner, Albert W., to Pitney Bowes Inc. Postage metering system having weight checking capability. 4,516,209, Cl. 364-466.000.
Seaks, Charles E., Jr., to Johnson Service Company. Control apparatus having modular construction. 4,516,189, Cl. 361-426.000.
Sears, Karl, to American Cyanamid Company. In-package insecticidal bait preparation utilizing microwave energy. 4,514,960, Cl. 53-440.000.
Sebag, Henri: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 4,515,775, Cl. 424-70.000.
Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom, The: *See—*
Singer, Alfred R. E., 4,515,864, Cl. 428-546.000.
Securitron-Magnalock Corp.: *See—*
Cook, Robert C., 4,516,114, Cl. 340-542.000.
Sedan, Jack D. Golf ball retriever. 4,515,402, Cl. 294-19.200.
Sedivy, Jan K.: *See—*
Jaskolski, Stanley V.; Schutten, Herman P.; Spellman, Gordon B.; Sedivy, Jan K.; and Jensen, Maurice W., 4,516,144, Cl. 357-27.000.
Segonne, Jean-marc, to 501 Maco Meudon Chemin de Genas. Compressor servomechanical regulator. 4,515,515, Cl. 417-26.000.
Seidel, William J.: *See—*
Pinede, Edourd; and Seidel, William J., 4,515,998, Cl. 179-146.00R.
Seifert, Jaroslav: *See—*
Flegel, Martin; Krojidlo, Milan; Kolinsky , Jiri ; Masek, Karel; and Seifert, Jaroslav, 4,515,715, Cl. 260-112.50R.
Seinera, Andre : *See—*
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Sekimoto, Misao: *See—*
Yoshihara, Hideo; Ozawa, Akira; Sekimoto, Misao; and Ono, Toshiro, 4,515,876, Cl. 430-5.000.
Sekiya, Tetsuo: *See—*
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Seligman, Peter: *See—*
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Semedo, Anthony B.: *See—*
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Seo, Iwazou: *See—*
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Serini, Volker: *See—*
Nouvertne, Werner; Serini, Volker; Neuray, Dieter; Binsack, Rudolf; Gehrke, Hans-Georg; Rempel, Dieter; and Krishnai, Sivara, 4,515,918, Cl. 524-504.000.
Setescak, Linda L.: *See—*
Martin, Lawrence L.; and Setescak, Linda L., 4,515,946, Cl. 548-237.000.
Seton Company: *See—*
Cioca, Gheorghe, 4,515,637, Cl. 424-94.000.
Sewell, James H.; Gaede, Hans; and Ritch, Curtis R., to Intech Corporation. Method for handling hosiery. 4,515,299, Cl. 223-76.000.
SFE Technologies: *See—*
Rosenberg, Michael A., 4,516,092, Cl. 333-184.000.
Sgroi, Carl M.; and Hubner, Klaus M. Apparatus for the collection of solar heat energy and a solar collector. 4,515,149, Cl. 126-442.000.
Shackle, Peter W., to AT&T Bell Laboratories. Control circuitry for high voltage solid-state switches. 4,516,037, Cl. 307-252.00A.
Shafai, Lotfollah: *See—*
Ittipiboon, Apisak; Shafai, Lotfollah; and Bridges, Ernest, 4,516,129, Cl. 343-772.000.
Shafrir, Doron; and Tamir, Giora. Display module. 4,514,920, Cl. 40-448.000.
Shaginian, Albert S.: *See—*
Gnatchenko, Viktor V.; Makarov, Nikolai P.; Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Panteleev, Valery A.; Androsenko, Alexandr P.; Davidenko, Nikolai I.; Mochalova, Zoya N.; and Palkin, Leonid N., 4,515,045, Cl. 81-429.000.
Shan, Chen J. Writing implement and kit. 4,515,492, Cl. 401-52.000.
Shannon, Harry D.; and Lutts, William P., to Shannon, Harry D. Convertible amphibious aircraft wheel position warning system. 4,516,124, Cl. 340-960.000.
Shannon, John M.; Hoeberechts, Arthur M. E.; and Van Gorkom, Gerardus G. P., to U.S. Philips Corporation. Electron sources and equipment having electron sources. 4,516,146, Cl. 357-52.000.
Shannon, Michael A.: *See—*
Garner, John N.; and Shannon, Michael A., 4,515,826, Cl. 427-8.000.
Sharp, David G.: *See—*
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Sharp Kabushiki Kaisha: *See—*
Furubayashi, Hisatoshi; Tanaka, Junichi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,515,653, Cl. 156-643.000.
Hakaridani, Mitsuhiro; Iwahashi, Hiroyuki; and Nishioka, Yoshiki, 4,516,215, Cl. 364-513.500.
Takiguchi, Masahiro, 4,516,139, Cl. 346-140.00R.
Shaw, Chong-Kuang, to B. F. Goodrich Company, The. Purification of mercaptobenzothiazole. 4,515,957, Cl. 548-177.000.
Shaw, Herbert J.; Chodorow, Marvin; and Digonnet, Michel J. F., to Leland Stanford Junior University, The Board of Trustees of the. Fiber optic amplifier. 4,515,431, Cl. 350-96.150.
Shell Oil Company: *See—*
Clegg, Joe D., 4,515,608, Cl. 55-193.000.
Diaz, Zaida, 4,515,764, Cl. 423-573.00R.
Sullivan, Don A., 4,515,726, Cl. 260-412.400.
Shen, Ming, to Olin Corporation. Process for preparing 1-alkyl-5-mercaptotetrazoles. 4,515,958, Cl. 548-251.000.
Shen, Tsung-Ying: *See—*
Yang, Shu S.; Beattie, Thomas R.; Durette, Philippe L.; Gallagher, Timothy F.; and Shen, Tsung-Ying, 4,515,722, Cl. 260-403.000.
Sherman, James E.: *See—*
Barkhau, Marvin L.; Perry, Philip D.; Poundstone, Donald H.; and Sherman, James E., 4,515,614, Cl. 65-29.000.
Sherwin, James S., to National Semiconductor Corporation. Fiber optics heat formed assembly. 4,515,432, Cl. 350-96.200.
Sherwood, Edward F.; Orndorff, Karl B.; and Dillon, Charles M., to Westinghouse Electric Corp. Architrave. 4,514,946, Cl. 52-211.000.
Sheu, Roung-Hwang. Coupling device. 4,515,280, Cl. 211-189.000.
Shevchenko, Jury A.: *See—*
Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., 4,515,156, Cl. 128-202.260.
Shiba, Haruo; Sakata, Yoshiya; and Tanaka, Kimio, to TDK Corporation. Reel for a magnetic tape. 4,515,322, Cl. 242-71.800.
Shibata, Yoichi; Kimura, Ryosuke; Sumigama, Takashi; and Izumi, Masaro, to Nippon Kokan Kabushiki Kaisha. Simultaneous multipoint sounding apparatus. 4,515,350, Cl. 266-92.000.
Shichiri, Motoaki: *See—*
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Shields, Dean W. Log handling and sawing system. 4,515,196, Cl. 144-378.000.
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikawa, Yasuhiko; and Nagashima, Takashi, to Mita Industrial Company Limited. Copying apparatus having a copy sheet sorter. 4,515,464, Cl. 355-14.00R.
Shih, Hung Y., to DeGeorge Ceilings, Inc. Ceiling fan. 4,515,538, Cl. 417-572.000.
Shikama, Takashi; Yamamoto, Tomoyuki; and Yokota, Atsuo, to Murata Manufacturing Co., Ltd. Lamp protection arrangement. 4,516,054, Cl. 315-71.000.
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, to Terumo Corporation. Neem bark extracts. 4,515,785, Cl. 424-195.100.
Shin-Etsu Chemical Co., Ltd.: *See—*
Mori, Shigeru; Kudo, Yoshiaki; and Kuwata, Satoshi, 4,515,702, Cl. 252-49.600.
Shinko Electric Co., Ltd.: *See—*
Yamamoto, Kiwamu; and Tanaka, Tsuyoshi, 4,515,235, Cl. 180-168.000.
Shinohara, Toshio: *See—*
Moriyama, Masakazu; Shinohara, Toshio; Hirano, Kazuo; and Makino, Fumio, 4,516,121, Cl. 340-825.050.
Shinozaki, Nozomu: *See—*
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,516,061, Cl. 318-561.000.
Shinozaki, Takashi: *See—*
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.
Shinriki, Tatsuo, to Height Inc. Process of making encrusted bakery products. 4,515,819, Cl. 426-297.000.
Shintani, Tetsuo: *See—*
Matsushita, Nobuo; Furukawa, Tokinobu; Shintani, Tetsuo; Sumitani, Tomoaki; and Oda, Chikao, 4,515,008, Cl. 73-53.000.
Shioiri, Tomonori; and Ino, Takashi, to Research Association For Residual Oil Processing. Hydrocarbon conversion catalyst and process for preparing same. 4,515,902, Cl. 502-64.000.
Shiotsu, Osamu: *See—*
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Shipley Company Inc.: *See*—
Deckert, Cheryl A.; Couble, Edward C.; and Bonetti, William F., 4,515,829, Cl. 427-97.000.

Shiraishi, Akiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Grounding device for preventing electrolytic corrosion in the bearings of rotary electric machines. 4,515,417, Cl. 384-445.000.

Shirakawa, Yasuhiro: *See*—
Takahara, Takeshi; Ishii, Tsutomu; and Shirakawa, Yasuhiro, 4,515,706, Cl. 252-301.40H.

Shirako, Hideo, to Olympus Optical Co., Ltd. Tape cassette liner sheet arrangement. 4,516,181, Cl. 300-132.000.

Shirogami, Tamotsu; and Ueno, Mitsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrochemical power generator. 4,515,871, Cl. 429-34.000.

Shoji, Masakazu, to AT&T Bell Laboratories. Integrated circuit including logic array with distributed ground connections. 4,516,123, Cl. 340-825.860.

Shore, Sheldon G.; and Hsu, Wen-Liang, to Ohio State University Research Foundation, The. Synthesis of heteronuclear osmium carbonyl hydrides under gaseous hydrogen. 4,515,728, Cl. 260-429.0CY.

Showa Manufacturing Co., Ltd.: *See*—
Honma, Kenji; Asami, Toshio; Baba, Masayuki; and Nakayama, Sumio, 4,515,384, Cl. 280-276.000.

Shroyer, David, to Lamb-Weston, Inc. Apparatus and method for aligning and packaging elongated articles. 4,514,959, Cl. 53-428.000.

Shtrikman, Shmuel: *See*—
Pundak, Nachman; and Shtrikman, Shmuel, 4,514,987, Cl. 62-6.000.

Shulman, Grigory A.: *See*—
Khudosovtsev, Nikolai M.; Shevchenko, Jury A.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; Filimonovna, Ljudmila Y.; and Shulman, Grigory A., 4,515,156, Cl. 128-202.260.

SI Handling Systems, Inc.: *See*—
Jacoby, Charles E., 4,515,084, Cl. 104-166.000.
Rohrbach, Peter H., 4,515,085, Cl. 104-250.000.

Sieber, Albrecht: *See*—
Buck, Rainer; Kull, Hermann; Piwonka, Fridolin; Sieber, Albrecht; Stumpp, Gerhard; and Wessel, Wolf, 4,515,125, Cl. 123-359.000.

Siede, Heinz-Jurgen: *See*—
Schimmelpfennig, Wolfgang; and Siede, Heinz-Jurgen, 4,516,027, Cl. 250-338.000.

Siefert, William J.: *See*—
Roeder, Charles L.; Siefert, William J.; and Theijsmeijer, Frederik, 4,515,832, Cl. 427-233.000.

Siemens Aktiengesellschaft: *See*—
Bany, Peter-Michael; Berger, Wolfgang; Bettge, Hans; Bialkowski, Gunter; Rozek, Rafl; Steinemer, Norbert; and Volkmann, Claus-Jurgen, 4,516,004, Cl. 200-144.00B.
Heerlein, Manfred, 4,515,511, Cl. 416-131.000.
Kessler, Claus, 4,516,188, Cl. 361-408.000.
Sauer, Anton; and Thinschmidt, Hans, 4,516,204, Cl. 364-200.000.
Scheckel, Bruno; and Wittenzellner, Ernst, 4,516,113, Cl. 340-384.00E.

Siemens-Albis AG: *See*—
Nyffeler, Felix, 4,516,093, Cl. 333-193.000.

Siemens-Allis, Inc.: *See*—
Culligan, John C.; Stich, Frederick A.; and Williams, Conrad F., 4,516,185, Cl. 361-154.000.
Gallatin, Paul M.; Dyken, Henry J.; and Cvengros, Norbert F., 4,516,005, Cl. 200-147.00R.

Sigiyama, Hiroyuki; Sakurai, Masaki; Abe , Ryozo; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. System for pausing reproduction in rotary recording medium reproducing apparatus. 4,516,161, Cl. 358-342.000.

Sikdar, Subhas K.; and Yeboah, Yaw D., to General Electric Company. Catalyzed interfacial polycondensation polycarbonate process. 4,515,936, Cl. 528-200.000.

Silverstein, Joseph D. Universal automotive battery holddown system. 4,515,233, Cl. 180-68.500.

Simader, Fritz: *See*—
Petter, Helmut; Bildstein, Hubert; and Simader, Fritz, 4,516,255, Cl. 378-143.000.

Siminoff, Roger H. Geared tuning machine. 4,515,059, Cl. 84-306.000.

Simmons, Frederick J.: *See*—
Keller, Douglas V., Jr.; and Simmons, Frederick J., 4,515,602, Cl. 44-51.000.

Simon, Jaime; Wilson, David A.; and Volkert, Wynn A., to Dow Chemical Company, The. Radioactive metals complexed with phosphonate derivatives of dicyclopentadienebis(methylamine). 4,515,767, Cl. 424-1.100.

Simonnot, Jack: *See*—
Jardinier, Pierre; and Simonnot, Jack, 4,515,308, Cl. 236-49.000.

Simonson, John L.: *See*—
Marinak, Michael J.; and Simonson, John L., 4,515,953, Cl. 546-345.000.

Simpson, Jay R.: *See*—
Howard, Richard E.; Pleibel, William; Simpson, Jay R.; and Stolen, Rogers H., 4,515,436, Cl. 350-96.330.

Simpson, Marc L.; and McNeilly, David R., to United States of America, Energy. Light-operated proximity detector with linear output. 4,516,020, Cl. 250-214.00L.

Sims, Bernard: *See*—
Chow, San-Laung; and Sims, Bernard, 4,515,810, Cl. 514-530.000.

Singer, Alfred R. E., to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom, The. Solid metal articles from built up splat particles. 4,515,864, Cl. 428-546.000.

Singer, Arnold M.: *See*—
Oliver, John E., Jr.; and Singer, Arnold M., 4,515,699, Cl. 252-8.55R.

Singer Company, The: *See*—
Creed, Gerald J., 4,515,099, Cl. 112-279.000.
Pillari, Joseph C.; and Willging, Arthur W., 4,516,076, Cl. 324-418.000.

Siniza, Bernhard: *See*—
Nolting, Rolf; and Siniza, Bernhard, 4,515,175, Cl. 137-107.000.

Sirand, Joseph, to S.A.R.L Centre d'Etude et de Realisation d'Equipment et de Materiel C.E.R.E.M. Ignition and fuel supply system for a gas-fueled heat-radiator. 4,515,554, Cl. 431-78.000.

Sitton, Willard J.; and Whaley, William L., to Joy Manufacturing Company. Valve seat structure. 4,515,347, Cl. 251-328.000.

Siwiak, Kazimierz, to Motorola, Inc. Three element low profile antenna. 4,516,127, Cl. 343-702.000.

Sizer, Phillip S.; Cox, Don C.; and Council, Malcolm N., to Otis Engineering Corporation. Apparatus and method for rotating coil tubing in a well. 4,515,220, Cl. 166-384.000.

Sjogren, C. Norman, to Belwith International, Ltd. Sliding door lock. 4,514,996, Cl. 70-100.000.

Skerlos, Peter C., to Zenith Electronics Corporation. Dual mode UHF tuning system. 4,516,170, Cl. 358-191.100.

Skillman, David B.: *See*—
Scanland, Joseph E.; and Skillman, David B., 4,514,967, Cl. 56-14.700.

Skorecki, Jan, to National Research Development Corporation. Mounting for a vibrating system. 4,515,122, Cl. 123-198.00E.

Slavik, Walter; and Rebsamen, Arthur, to Maschinenfabrik Schweiter AG. Traverse winding frame for producing the winding of a package. 4,515,320, Cl. 242-18.0DD.

Slavin, Martin J., to Intech Systems Corp. Differential doppler for blood flow measurement. 4,515,164, Cl. 128-663.000.

Slemmons, Arthur J.; and Newgard, Peter J., to SRI International. Fiber-reinforced concrete solar collector. 4,515,151, Cl. 126-450.000.

Slezak, Pavel J.: *See*—
Vosmeyer, Wilhelm; Cole, Roderick; and Slezak, Pavel J., 4,515,111, Cl. 123-41.610.

Sloan, Albert H. Well point system and apparatus. 4,515,517, Cl. 417-46.000.

Slump, William R., to United States of America, Navy. Pulsewidth modulated, charge transfer, digital to analog converter. 4,516,111, Cl. 340-347.0DA.

Slusarek, Wojciech: *See*—
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,515,947, Cl. 544-295.000.

SMEC, Inc.: *See*—
Schiff, Peter, 4,515,587, Cl. 604-96.000.

Smit, Hermanus, to U.S. Philips Corporation. Coaxial cable with a connector. 4,515,427, Cl. 339-177.00E.

Smith, Douglas G.: *See*—
Pugh, Stuart; Smith, Douglas G.; Lee, Chee M.; Parr, Leslie R.; Birkett, John N.; Stibbs, Richard G.; and Tai, Tet C., 4,515,333, Cl. 248-122.000.

Smith International, Inc.: *See*—
Dailey, Patrick E., 4,515,225, Cl. 175-40.000.

Smith, Jerry D.; and Szymczak, Edward J., to Cameron Iron Works, Inc. Wellhead assembly. 4,515,400, Cl. 285-141.000.

Smith, John; and Boiston, David A., to Courtaulds PLC. Heat exchanger having a plastics membrane. 4,515,210, Cl. 165-133.000.

Smith, John L.; and Christiano, Vito F., to Technicon Instruments Corporation. Integral reagent dispenser. 4,515,753, Cl. 422-102.000.

Smith Kline & French Laboratories Limited: *See*—
Adger, Brian M.; and O'Rourke, David J., 4,515,952, Cl. 546-329.000.

Smith, Michael D.; and Whatley, Roger A., to Motorola, Inc. Amplifier circuit for minimizing output voltage power-up transients. 4,516,082, Cl. 330-296.000.

Smith, Peter W.; and Tomlinson, Walter J., III, to AT&T Bell Laboratories. Nonlinear and bistable optical waveguide devices. 4,515,429, Cl. 350-96.130.

Smith, Richard D.: *See*—
Van Grouw, Samual J.; and Smith, Richard D., 4,515,147, Cl. 126-163.00R.

Smith, Robert C.; and Cox, A. Benns, II, to G. S. Blodgett Co., Inc. Dual flow heating apparatus. 4,516,012, Cl. 219-400.000.

Smith, Thomas E.: *See*—
Kinsbron, Eliezer; Lynch, William T.; and Smith, Thomas E., 4,514,893, Cl. 29-571.000.

Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Mazzola, Massimo; and Cipriani, Aldo, 4,515,908, Cl. 521-182.000.

Snowdon, Brian, to Macawber Engineering Limited. Method and apparatus for unblocking conveying pipes for particulate material. 4,515,503, Cl. 406-11.000.

Societa Pneumatici Pirelli: *See*—
Salvadori, Bruno, 4,515,541, Cl. 425-47.000.

Societe Anonyme D.B.A.: *See*—
Escarabajal, Gislain; and Maligne, Jean-Charles, 4,515,249, Cl. 188-73.380.

Societe Anonyme dite: L'Oreal: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,515,775, Cl. 424-70.000.

Societe d'Etudes et de Recherches de Ventilation et d'Aerauliques: *See*—
Jardinier, Pierre; and Simonnot, Jack, 4,515,308, Cl. 236-49.000.
Societe Francaise Hoechst: *See*—
Christidis, Yani; and Vallejos, Jean-Claude, 4,515,970, Cl. 549-79.000.
Soda, Yutaka: *See*—
Imakoshi, Shigeyoshi; Soda, Yutaka; Uchida, Hiroyuki; Sugita, Junkichi; Takino, Hiroshi; Sekiya, Tetsuo; and Suyama, Hideo, 4,516,179, Cl. 360-113.000.
Sodastream Limited: *See*—
Mabb, Kenneth G., 4,514,994, Cl. 62-389.000.
Soder, Alfons: *See*—
Hinze, Heinz-Joachim; Soder, Alfons; and Popendiker, Kurt, 4,515,795, Cl. 514-263.000.
Soga, Tasao: *See*—
Wakui, Yoko; Hachino, Hiroaki; Sawahata, Mamoru; Soga, Tasao; Yasuda, Tomio; and Ooue, Michio, 4,516,149, Cl. 357-71.000.
Solid State Chargers Research and Development Limited Partnership: *See*—
Hoffman, Philip A., 4,516,067, Cl. 323-265.000.
Sonerud, John T. Pipelaying appliance. 4,515,522, Cl. 414-747.000.
Sony Corporation: *See*—
Amano, Yoshifumi, 4,516,053, Cl. 313-584.000.
Imakoshi, Shigeyoshi; Soda, Yutaka; Uchida, Hiroyuki; Sugita, Junkichi; Takino, Hiroshi; Sekiya, Tetsuo; and Suyama, Hideo, 4,516,179, Cl. 360-113.000.
Katakura, Masayuki, 4,516,081, Cl. 330-254.000.
Miyata, Katsuro; Asaida, Takashi; and Nagumo, Fumio, 4,516,172, Cl. 358-228.000.
Quan, Ronald, 4,516,041, Cl. 307-494.000.
Sony/Tektronix Corporation: *See*—
Fukuta, Minoru, 4,516,119, Cl. 340-722.000.
Sorich, Richard A., to CooperVision, Inc. Operative elliptical probe for ultrasonic surgical instrument and method of its use. 4,515,583, Cl. 604-22.000.
Sosebee, B. Lamar: *See*—
Walker, Paul; Hamrick, Glen F.; and Sosebee, B. Lamar, 4,515,646, Cl. 156-78.000.
Souma, Kenichi: *See*—
Azuhata, Shigeru; Arashi, Norio; Narato, Kiyoshi; Inada, Tooru; Souma, Kenichi; Ohtsuka, Keizou; Hishinuma, Yukio; and Masai, Tadahisa, 4,515,094, Cl. 110-347.000.
Soumai, Masamichi: *See*—
Ogura, Shunichiro; and Soumai, Masamichi, 4,515,661, Cl. 203-60.000.
South American Placers, Inc.: *See*—
Vargas, Alfredo P., 4,515,688, Cl. 209-167.000.
Southern Chemical Products Company: *See*—
Udall, Raymond E., 4,515,294, Cl. 222-105.000.
Sovonics Solar Systems: *See*—
Fournier, Eugene; and Doehler, Joachim, 4,515,107, Cl. 118-718.000.
Spaargaren, Robert, to Allied Corporation. Spring clutch for duo-servo drum brake. 4,515,250, Cl. 188-79.5GT.
Sparkman, David M., to Thiokol Corporation. Method of and apparatus for grinding solid organic waste material encountered in sewage waste and waste water reclamation. 4,515,317, Cl. 241-5.000.
Spellman, Gordon B.: *See*—
Jaskolski, Stanley V.; Schutten, Herman P.; Spellman, Gordon B.; Sedivy, Jan K.; and Jensen, Maurice W., 4,516,144, Cl. 357-27.000.
Spencer Wright Industries, Inc.: *See*—
Ingram, Gary L., 4,515,096, Cl. 112-79.00R.
Sperry Corporation: *See*—
Isenberg, Gerry E.; Forshey, Terry L.; and Keller, Robert D., Jr., 4,515,353, Cl. 266-236.000.
Underhill, Kenneth R., 4,514,968, Cl. 56-341.000.
Wahlquist, Clayton C., 4,516,118, Cl. 340-703.000.
Spetsialnoe Konstruktorskoe Bjuro Seismicheskoi Tekhniki: *See*—
Gnatchenko, Viktor V.; Makarov, Nikolai P.; Shaginian, Albert S.; Asan-Dzhalalov, Alexei G.; Pevnev, Anatoly A.; Panteleev, Valery A.; Androsenko, Alexandr P.; Davidenko, Nikolai I.; Mochalova, Zoya N.; and Palkin, Leonid N., 4,515,045, Cl. 81-429.000.
Spiegler, Wolfgang: *See*—
Rentzsea, Costin; Spiegler, Wolfgang; and Jung, Johann, 4,515,616, Cl. 71-76.000.
Spielman, Rick B.: *See*—
Vigil, Samuel A.; and Spielman, Rick B., 4,516,043, Cl. 310-11.000.
SPOFA, spojene podniky pro zdratvonickou vyrobu: *See*—
Flegel, Martin; Krojidlo, Milan; Kolinsky , Jiri ; Masek, Karel; and Seifert, Jaroslav, 4,515,715, Cl. 260-112.50R.
Sprague, Robert S. Flip card apparatus for forming units of speech. 4,515,566, Cl. 434-172.000.
Spraybake Limited: *See*—
Crisp, Eric H., 4,515,072, Cl. 98-115.200.
Springer, Helmut: *See*—
Bernhagen, Wolfgang; Falk, Volker; Springer, Helmut; Weber, Jurgen; Wiebus, Ernst; and Kniep, Claus, 4,515,986, Cl. 564-471.000.
SRI International: *See*—
Slemmons, Arthur J.; and Newgard, Peter J., 4,515,151, Cl. 126-450.000.
Stabler, Manfred: *See*—
Borst, Erich; Schadlich, Fritz; and Stabler, Manfred, 4,516,045, Cl. 310-68.00E.
Staendeke, Horst: *See*—
Maurer, Alexander; and Staendeke, Horst, 4,515,632, Cl. 106-18.160.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Pneumatic cleaning apparatus for open end friction spinning machines. 4,514,972, Cl. 57-301.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Mobile cleaning device for open end friction spinning machines. 4,514,973, Cl. 57-301.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Open end friction spinning machine. 4,514,974, Cl. 57-401.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Friction roller arrangement for open end friction spinning machine. 4,514,975, Cl. 57-401.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,514,972, Cl. 57-301.000.
Stahlecker, Fritz, 4,514,973, Cl. 57-301.000.
Stahlecker, Fritz, 4,514,974, Cl. 57-401.000.
Stahlecker, Fritz, 4,514,975, Cl. 57-401.000.
Stahler, Fritz: *See*—
Klose, Sigmar; Stahler, Fritz; Lange, Hans; and Kleemann, Wolfgang, 4,515,889, Cl. 435-4.000.
Stahler, John P., to Robot Research, Inc. Color slow scan video signal translation. 4,516,151, Cl. 358-14.000.
Stamper, Richard W.; and Hultz, Robert C., to General Tire & Rubber Company, The. Vinyl chloride polymer laminate. 4,515,744, Cl. 264-171.000.
Standard Microsystems Corporation: *See*—
Zapisek, John M.; and Giulekas, Gus, 4,516,040, Cl. 307-468.000.
Standard Oil Company, The: *See*—
Bartoszek-Loza, Rosemary, 4,515,667, Cl. 204-162.00R.
Brazdil, James F., Jr.; Marritt, William A.; and Ward, Michael D., 4,515,732, Cl. 260-465.600.
Standard Oil Company (Indiana): *See*—
Brooks, Gary T.; and Cole, Bill W., 4,515,924, Cl. 525-432.000.
Edwards, Robert C., 4,515,904, Cl. 502-209.000.
Standard Products Company, The: *See*—
Nussbaum, Joel H., 4,515,649, Cl. 156-244.110.
Stanefski, Eugene F.: *See*—
Schaumburg, Edward G.; and Stanefski, Eugene F., 4,515,187, Cl. 141-1.000.
Stanley, John H., to Goodyear Tire & Rubber Company, The. Hose coupling crimper and method of crimping. 4,515,006, Cl. 72-402.000.
Starner, Eugene R., to RCA Corporation. Event selector for wide range probability of occurrence. 4,516,217, Cl. 364-717.000.
State of Israel, Ministry of Agriculture, The: *See*—
Feller, Ron; and Mizrach, Amos, 4,515,276, Cl. 209-693.000.
Stauffer Chemical Company: *See*—
Fancher, Llewellyn W.; and Scher, Herbert B., 4,515,813, Cl. 514-563.000.
Green, Laddie L., 4,515,627, Cl. 71-95.000.
Steffes, William J., to Coleman Company, Inc., The. Multiple use shelf for cooler. 4,515,421, Cl. 312-351.000.
Stegelmeier, Hartmut; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidally active pyrano-pyrazole derivatives. 4,515,801, Cl. 514-403.000.
Stehning, Werner, to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft. Washing tower for the desulfurization of flue gases. 4,515,754, Cl. 422-168.000.
Steinemer, Norbert: *See*—
Bany, Peter-Michael; Berger, Wolfgang; Bettge, Hans; Bialkowski, Gunter; Rozek, Rafl; Steinemer, Norbert; and Volkmann, Claus-Jurgen, 4,516,004, Cl. 200-144.00B.
Steinleitner, Gunther, to Brown, Boveri & Cie Ag. Electrochemical storage cell. 4,515,874, Cl. 429-104.000.
Stenzel, Gerhard: *See*—
Kaule, Wittich; Renz, Walter; and Stenzel, Gerhard, 4,516,031, Cl. 250-562.000.
Stephansen, Erik W., to Impact Systems, Inc. Apparatus for drying a moving web having movable dryer modules. 4,514,913, Cl. 34-48.000.
Stephenson, Tom, to Petroleum Meter & Pump Co., Inc. Extended range variator for fuel pump computer. 4,515,030, Cl. 74-348.000.
Sterling Drug Inc.: *See*—
Bailey, Denis M., 4,515,980, Cl. 560-45.000.
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,515,797, Cl. 514-349.000.
Stern, Richard A.: *See*—
Bayha, William T.; Borowick, John; Stern, Richard A.; and Babbitt, Richard W., 4,516,131, Cl. 343-785.000.
Stettner, Ernest R., to General Motors Corporation. Edge discharge pulse fuel injector. 4,515,129, Cl. 123-472.000.
Stevens, Bradley D.: *See*—
McCullough, Thomas W.; and Stevens, Bradley D., 4,515,907, Cl. 521-139.000.
Stewart, Alvin E. Tool assembly for removal and installation of freeze plugs. 4,514,890, Cl. 29-256.000.
Stewart, James F. Food pouch opening device. 4,514,902, Cl. 30-2.000.
Stewart, William E. Liquid clarifying apparatus and methods. 4,515,698, Cl. 210-802.000.
Steyert, William A.: *See*—
Lawless, William N.; Cross, Leslie E.; and Steyert, William A., 4,515,534, Cl. 417-322.000.

Stibbs, Richard G.: *See—*
Pugh, Stuart; Smith, Douglas G.; Lee, Chee M.; Parr, Leslie R.; Birkett, John N.; Stibbs, Richard G.; and Tai, Tet C., 4,515,333, Cl. 248-122.000.
Stich, Frederick A.: *See—*
Culligan, John C.; Stich, Frederick A.; and Williams, Conrad F., 4,516,185, Cl. 361-154.000.
Sticht, Walter, to Stiwa-Fertigungstechnik Sticht Gesellschaft M.B.H. Assembly line. 4,515,264, Cl. 198-344.000.
Stinger, Walter E., Jr. Direct digital loudspeaker. 4,515,997, Cl. 179-111.00R.
Stiwa-Fertigungstechnik Sticht Gesellschaft M.B.H.: *See—*
Sticht, Walter, 4,515,264, Cl. 198-344.000.
Stolen, Rogers H.: *See—*
Howard, Richard E.; Pleibel, William; Simpson, Jay R.; and Stolen, Rogers H., 4,515,436, Cl. 350-96.330.
Stone, David R.: *See—*
Boehm, Russell W.; Rippstein, Robert P.; and Stone, David R., 4,515,544, Cl. 425-129.00R.
Stone, Julian: *See—*
Burrus, Charles A., Jr.; and Stone, Julian, 4,515,612, Cl. 65-3.120.
Stoner, Richard J., Jr.: *See—*
Schorr, Steven M.; and Stoner, Richard J., Jr., 4,514,930, Cl. 47-60.000.
Storage Technology Partners: *See—*
Chang, Jenq S.; and Chang, Tung S., 4,516,145, Cl. 357-42.000.
Story, Allan. Apparatus for facilitating visual meter readings. 4,515,437, Cl. 350-114.000.
Stotler, David V.; and Coffey, Fred S., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing a continuous glass filament mat. 4,515,613, Cl. 65-4.400.
Stout, Gregg W., to Baker Oil Tools, Inc. Perforating gun pressure activated sliding sleeve. 4,515,217, Cl. 166-297.000.
Strauss, Harry W.: *See—*
Castronovo, Frank P.; Strauss, Harry W.; and Potsaid, Majic S., 4,515,766, Cl. 424-1.100.
Street, Jeffrey B., to Verbatim Corporation. Magnetic head cleaning diskette. 4,516,176, Cl. 360-75.000.
Streetman, William E.: *See—*
De Maria, Francesco; and Streetman, William E., 4,515,859, Cl. 428-398.000.
Strickland, Robert M., Jr.: *See—*
Fabris, Alfonso V.; Strickland, Robert M., Jr.; and Toth, John T., 4,516,156, Cl. 358-85.000.
Strom, Alice M.; Herr, R. Wilbur; and Martin, Sylvia, to OMI International Corporation. Acid zinc and zinc alloy electroplating solution and process. 4,515,663, Cl. 204-44.200.
Strubhar, Malcolm K.: *See—*
Fitch, John L.; and Strubhar, Malcolm K., 4,515,214, Cl. 166-250.000.
Stuart, Ian C. E.: *See—*
Heathcoat, Michael J.; Jackson, Douglas H.; Jowitt, Frederick W.; Madley, Jack R.; and Stuart, Ian C. E., 4,515,677, Cl. 204-300.0EC.
Stubbs, John K.: *See—*
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,515,799, Cl. 514-341.000.
Stumpfi, Werner; Bettinger, Gunter; Engel, Friedrich; Fitterer, Horst; Kreimes, Norbert; Pfefferkorn, Dietmar; Schaffer, Norbert; and Schmidts, Kurt, to BASF Aktiengesellschaft. Hub for magnetic tape cassettes, especially compact cassettes, and magnetic tape cassette possessing one or more such hubs. 4,515,331, Cl. 242-199.000.
Stumpp, Gerhard: *See—*
Buck, Rainer; Kull, Hermann; Piwonka, Fridolin; Sieber, Albrecht; Stumpp, Gerhard; and Wessel, Wolf, 4,515,125, Cl. 123-359.000.
Stypher Corporation: *See—*
Moxon, Edwin C., 4,516,164, Cl. 360-53.000.
Suarez, Adoracion F.: *See—*
Manderino, George L.; and Suarez, Adoracion F., 4,515,890, Cl. 435-7.000.
Suda, Kaoru: *See—*
Nakata, Yukio; Terada, Matsuaki; Suda, Kaoru; Morito, Motoyoshi; and Shiotsu, Osamu, 4,516,221, Cl. 364-900.000.
Sudo, Tadashi: *See—*
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, 4,515,785, Cl. 424-195.100.
Sueshige, Hiroshi: *See—*
Ogano, Takeo; Sueshige, Hiroshi; and Hatakeyama, Sakichi, 4,514,917, Cl. 37-249.000.
Sugai, Hiroshi: *See—*
Ninomiya, Hisakazu; Ibori, Satoshi; Nagase, Hiroshi; Igarashi, Sadayuki; and Sugai, Hiroshi, 4,516,065, Cl. 318-811.000.
Sugai, Kazuyoshi: *See—*
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Sugai, Kazuyoshi, 4,516,049, Cl. 310-313.00A.
Sugimoto, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear magnetic resonance diagnostic apparatus. 4,516,074, Cl. 324-309.000.
Suginuma, Atsushi: *See—*
Hayase, Isao; Suginuma, Atsushi; Kishi, Atsuo; and Kawashima, Kenichi, 4,515,514, Cl. 418-150.000.
Sugita, Junkichi: *See—*
Imakoshi, Shigeyoshi; Soda, Yutaka; Uchida, Hiroyuki; Sugita, Junkichi; Takino, Hiroshi; Sekiya, Tetsuo; and Suyama, Hideo, 4,516,179, Cl. 360-113.000.
Sulkowski, Alfred. Heat exchange system with space heating, space cooling and hot water generating cycles. 4,514,990, Cl. 62-238.700.
Sullivan, Daniel S.: *See—*
Haslegrave, John A.; and Sullivan, Daniel S., 4,515,708, Cl. 252-390.000.
Sullivan, Don A., to Shell Oil Company. Oilseed extraction process. 4,515,726, Cl. 260-412.400.
Sullivan, Paul E.; and Peppel, George W., to Lockheed Corporation. Symmetrically loaded flexible connector having multiple passageways. 4,515,399, Cl. 285-95.000.
Sumal, Jaihind S., to Robert Bosch GmbH. Apparatus for measuring the mass of a flowing medium. 4,515,014, Cl. 73-202.000.
Sumi, Koji: *See—*
Matsuzaki, Tadashi; and Sumi, Koji, 4,516,183, Cl. 361-71.000.
Sumigama, Takashi: *See—*
Shibata, Yoichi; Kimura, Ryosuke; Sumigama, Takashi; and Izumi, Masaro, 4,515,350, Cl. 266-92.000.
Sumitani, Tomoaki: *See—*
Matsushita, Nobuo; Furukawa, Tokinobu; Shintani, Tetsuo; Sumitani, Tomoaki; and Oda, Chikao, 4,515,008, Cl. 73-53.000.
Sumitomo Chemical Company, Limited: *See—*
Okamoto, Hideho; Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,515,866, Cl. 428-614.000.
Yamamoto, Kazuhito; and Takenaka, Toshio, 4,515,917, Cl. 524-178.000.
Sumitomo Electric Industries, Ltd.: *See—*
Moriyama, Masakazu; Shinohara, Toshio; Hirano, Kazuo; and Makino, Fumio, 4,516,121, Cl. 340-825.050.
Sunburst Laboratories, Inc.: *See—*
Ehrlichmann, Merlin W., 4,515,089, Cl. 110-235.000.
Suncoast Medical Manufacturing Co.: *See—*
Johns, David L., 4,516,194, Cl. 362-202.000.
Sundstrand Corporation: *See—*
Glennon, Timothy F., 4,516,038, Cl. 307-264.000.
Sundvall, Kenneth, to Forenade Fabriksverken. Arrangement in a fuse for projectiles with explosive charge for changing over between direct and delayed ignition of the explosive charge. 4,515,081, Cl. 102-266.000.
Superior Electric Company, The: *See—*
Brigham, Robert N., 4,516,048, Cl. 310-254.000.
Supreme Casting & Tooling: *See—*
Kovacs, Steve A., 4,515,842, Cl. 428-36.000.
Surdilla, Silverio B. Variable ratio liquid metering dispenser. 4,515,296, Cl. 222-134.000.
Susumi, Sadao: *See—*
Kawahara, Tetsuo; Mizokami, Hiroshi; Mizuno, Kyosuke; and Susumi, Sadao, 4,515,714, Cl. 260-112.00R.
Suyama, Hideo: *See—*
Imakoshi, Shigeyoshi; Soda, Yutaka; Uchida, Hiroyuki; Sugita, Junkichi; Takino, Hiroshi; Sekiya, Tetsuo; and Suyama, Hideo, 4,516,179, Cl. 360-113.000.
Suzuki, Hiro. Bung for jars. 4,515,283, Cl. 215-270.000.
Suzuki, Kohji, to Ricoh Company, Ltd. Magnet brush cleaning apparatus for electrophotographic copying machine. 4,515,467, Cl. 355-15.000.
Suzuki, Norio: *See—*
Boigegrain, Robert; Maffrand, Jean-Pierre; Suzuki, Norio; Matsubayachi, Kynichi; and Ashida, Shinichiro, 4,515,951, Cl. 546-114.000.
Suzuki, Tadashi: *See—*
Takeuchi, Yasuhisa; Morimoto, Yoshiro; and Suzuki, Tadashi, 4,515,040, Cl. 74-866.000.
Suzuki, Tomio: *See—*
Morimoto, Kotaro; and Suzuki, Tomio, 4,515,553, Cl. 431-8.000.
Suzuki, Yukio; Sato, Kunihiko; and Muramatsu, Motoyasu, to Toyota Jidosha Kabushiki Kaisha. Fuel-injection control in an internal-combustion engine. 4,515,131, Cl. 123-491.000.
Swearingen, Loren L.; and LaTulip, Randy J., to Dow Chemical Company, The. Hydroxystyrylazapolymers. 4,515,938, Cl. 528-252.000.
Swider, Robert A.; and Horsch, Martha E., to Ford Motor Company. Self-crosslinkable electrocoat resins prepared by room temperature reactions by epoxy resins and polyamines containing primary and tertiary amine groups. 4,515,911, Cl. 523-414.000.
Swithenbank, Colin: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,515,988, Cl. 568-586.000.
Syntex Corporation: *See—*
Holton, Percy G., 4,515,811, Cl. 514-554.000.
SYNTEX (U.S.A.) Inc.: *See—*
Patterson, John W., Jr.; and Pfister, Jurg R., 4,515,727, Cl. 260-413.000.
Synthelabo: *See—*
Wick, Alexander E.; and Binet, Jean, 4,515,814, Cl. 514-652.000.
Sypula, Donald S.: *See—*
Mammino, Joseph; Sypula, Donald S.; Abramsohn, Dennis A.; Abkowitz, Martin A.; and Scharfe, Merlin E., 4,515,882, Cl. 430-58.000.
Systems Research Laboratories, Inc.: *See—*
Ballard, Paul T.; and Little, Gordon R., 4,515,478, Cl. 356-345.000.
Szala, Lawrence E.: *See—*
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,515,746, Cl. 264-332.000.
Szczepanski, Henry, to Ciba Geigy Corporation. N-(Cyclopropyltriazinyl-n'-(arylsulfonyl) ureas having herbicidal activity. 4,515,626, Cl. 71-93.000.

Szenger, Franz, to Carl-Zeiss-Stuftung, Heidenheim/Brenz. Plain bearing. 4,515,415, Cl. 308-6.00R.
Szymczak, Edward J.: *See*—
Smith, Jerry D.; and Szymczak, Edward J., 4,515,400, Cl. 285-141.000.
T.D. Williamson, Inc.: *See*—
Baudoux, Richard; and Webb, Anthony J., 4,515,287, Cl. 220-316.000.
Tachibana, Hajime: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.
Tachikawa Spring Co., Ltd.: *See*—
Aoki, Akira; and Ito, Kunihiko, 4,514,869, Cl. 5-472.000.
Tackles, George, to Oakley, Inc. Sunglasses. 4,515,448, Cl. 351-41.000.
Tai, Tet C.: *See*—
Pugh, Stuart; Smith, Douglas G.; Lee, Chee M.; Parr, Leslie R.; Birkett, John N.; Stibbs, Richard G.; and Tai, Tet C., 4,515,333, Cl. 248-122.000.
Taiho Industries Co. Ltd.: *See*—
Manabe, Nobuyuki; and Goto, Takahiro, 4,515,312, Cl. 239-227.000.
Tajima, Akira: *See*—
Takahashi, Sadatoshi; Tsuji, Sadahiko; Tajima, Akira; Asano, Toshiaki; and Minami, Setsuo, 4,515,446, Cl. 350-427.000.
Tajima, Noriyasu: *See*—
Sakura, Yasuhiro; Nakajima, Yasushi; Tajima, Noriyasu; and Nimura, Hitoshi, 4,516,208, Cl. 364-466.000.
Tajima, Osamu: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,515,351, Cl. 266-177.000.
Takagi, Kiyotaka: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,515,584, Cl. 604-66.000.
Takagi, Masayuki: *See*—
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; and Yoshida, Toshihiro, 4,516,180, Cl. 360-126.000.
Takahara, Takeshi; Ishii, Tsutomu; and Shirakawa, Yasuhiro, to Kabushiki Kaisha Toshiba. Rare earth oxyfluoride barium fluoride halide phosphor. 4,515,706, Cl. 252-301.40H.
Takahashi, Mikio: *See*—
Nojima, Kazuhiro; Fujimoto, Hiroyuki; and Takahashi, Mikio, 4,515,833, Cl. 427-362.000.
Takahashi, Nobuaki: *See*—
Masuda, Isao; Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Ueno, Shoji, 4,516,163, Cl. 360-32.000.
Takahashi, Sadatoshi; Tsuji, Sadahiko; Tajima, Akira; Asano, Toshiaki; and Minami, Setsuo, to Canon Kabushiki Kaisha. Zoom objective. 4,515,446, Cl. 350-427.000.
Takahashi, Takashi: *See*—
Imai, Motomasa; Takahashi, Takashi; Furukawa, Osamu; and Kanai, Hideyuki, 4,516,105, Cl. 338-21.000.
Takahashi, Yoshinobu, to Toyota Jidosha Kabushiki Kaisha. Electrode for cationic electrodeposition coating. 4,515,674, Cl. 204-292.000.
Takahashi, Yosuke: *See*—
Amemori, Koichi; Kawabe, Toshihiko; and Takahashi, Yosuke, 4,515,120, Cl. 123-368.000.
Takaku, Masaaki: *See*—
Tsuneno, Tatsuro; and Takaku, Masaaki, 4,515,725, Cl. 260-410.700.
Takamatsu, Shunicti, to Itoki Kosakusho Co. Ltd. Article automatic storage and retrieval system. 4,515,508, Cl. 414-280.000.
Takamisawa Electric Co., Ltd.: *See*—
Fujii, Kunihisa; Tomono, Noboru; Watanabe, Hajime; and Miyakoshi, Yasushi, 4,516,099, Cl. 335-135.000.
Takano, Masashi: *See*—
Sawano, Kiyohito; Kouichi, Ryujiro; Oota, Hideaki; Takano, Masashi; and Moroe, Michio, 4,515,909, Cl. 523-102.000.
Takano, Toshio; and Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. Control system for an electromagnetic clutch for automobiles. 4,515,257, Cl. 192-0.075.
Takara Company, New York, Inc.: *See*—
Fujiyama, Kunio; Okamoto, Kei; and Yoshikawa, Noriyuki, 4,515,406, Cl. 297-409.000.
Takase, Yoshiyuki: *See*—
Yokogawa, Kanae; Kotani, Shozo; Kawata, Shigeo; and Takase, Yoshiyuki, 4,515,891, Cl. 435-69.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,515,788, Cl. 514-202.000.
Takata, Harry H., to Ag-Chem Equipment Co., Inc. Liquid waste application system with sludge gun. 4,515,311, Cl. 239-172.000.
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,515,788, Cl. 514-202.000.
Takenaka, Toshio: *See*—
Yamamoto, Kazuhito; and Takenaka, Toshio, 4,515,917, Cl. 524-178.000.
Takeo, Tadashi; Yamamoto, Toru; and Yamashito, Sachihiro, to Honda Giken Kogyo Kabushiki Kaisha. Welding torch apparatus. 4,515,521, Cl. 414-735.000.
Takeuchi, Yasuhisa; Morimoto, Yoshiro; and Suzuki, Tadashi, to Nissan Motor Company, Limited. Control apparatus and method for engine-continuously variable transmission. 4,515,040, Cl. 74-866.000.
Takiguchi, Masahiro, to Sharp Kabushiki Kaisha. Print control system in a color image printer. 4,516,139, Cl. 346-140.00R.
Takino, Hiroshi: *See*—
Imakoshi, Shigeyoshi; Soda, Yutaka; Uchida, Hiroyuki; Sugita, Junkichi; Takino, Hiroshi; Sekiya, Tetsuo; and Suyama, Hideo, 4,516,179, Cl. 360-113.000.
Takizawa, Masaaki: *See*—
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.
Tallman, William R.; McDevitt, Steven C.; and Delancey, Warren H., to Yukon Energy Corporation. Gas-fired condensing mode furnace. 4,515,145, Cl. 126-99.00A.
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihasa, to Fuji Xerox Co., Ltd. Ink jet printer shut-down control. 4,516,134, Cl. 346-75.000.
Tamir, Giora: *See*—
Shafrir, Doron; and Tamir, Giora, 4,514,920, Cl. 40-448.000.
Tamura, Masaru: *See*—
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.
Tan, Yoichi: *See*—
Kume, Hiroshi; and Tan, Yoichi, 4,516,240, Cl. 370-85.000.
Tanaka, Junichi: *See*—
Furubayashi, Hisatoshi; Tanaka, Junichi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,515,653, Cl. 156-643.000.
Tanaka, Kimio: *See*—
Shiba, Haruo; Sakata, Yoshiya; and Tanaka, Kimio, 4,515,322, Cl. 242-71.800.
Tanaka, Tsuyoshi: *See*—
Yamamoto, Kiwamu; and Tanaka, Tsuyoshi, 4,515,235, Cl. 180-168.000.
Tanba, Yoshihiro: *See*—
Kogame, Kunio; Tanba, Yoshihiro; and Makimura, Masaru, 4,515,854, Cl. 428-288.000.
Tang, Charlene. Method for coating and infusing nut products with honey-sucrose solution for roasting. 4,515,820, Cl. 426-309.000.
Tang, Robert H., to PPG Industries, Inc. Peroxide composition. 4,515,929, Cl. 526-228.000.
Taniguchi, Motoya: *See*—
Komeyama, Yoshihiro; and Taniguchi, Motoya, 4,516,254, Cl. 378-34.000.
Taniguchi, Nobuhiro; and Endo, Tomohiro, to Fujirebio Kabushiki Kaisha. Method of preparing gamma globulin suitable for intravenous administration. 4,515,776, Cl. 424-85.000.
Tanz, Heiner: *See*—
Eisenlohr, Karl-Heinz; Gaenssien, Hans; Kriebel, Manfred; and Tanz, Heiner, 4,515,604, Cl. 48-197.00R.
Tarzaiski, Richard J., to RCA Corporation. Dynamic record level control for optical disc recorder. 4,516,235, Cl. 369-116.000.
Taverna, Arthur R.; and Thompson, Warren S., to United States of America, Air Force. Erosion-resistant nosetip construction. 4,515,847, Cl. 428-107.000.
Taylor, Charles E.; Gattiker, Anton; and Krantz, Gary B., to Phase One Products, Corp. Combined photographic enlarger and print developing tray. 4,515,468, Cl. 355-27.000.
Taylor, Henry F. Fiber optic magnetic field sensor. 4,516,021, Cl. 250-227.000.
Taylor, John L. Rotary internal combustion engine. 4,515,123, Cl. 123-222.000.
Taylor, Mary J.: *See*—
Childs, Jerry; Sabins, Fred; and Taylor, Mary J., 4,515,216, Cl. 166-293.000.
Taylor, Maurice. Wheel having adjustment for axial position of rim relative to disc. 4,515,411, Cl. 301-9.0TV.
TDK Corporation: *See*—
Ishino, Ken; Hashimoto, Yasuo; Ichihara, Kenichi; and Narumiya, Yoshikazu, 4,515,850, Cl. 428-225.000.
Shiba, Haruo; Sakata, Yoshiya; and Tanaka, Kimio, 4,515,322, Cl. 242-71.800.
TDK Electronics Co., Ltd.: *See*—
Nakagawa, Shiro; and Kuroiwa, Akihiko, 4,516,234, Cl. 369-109.000.
Technicon Instruments Corporation: *See*—
Smith, John L.; and Christiano, Vito F., 4,515,753, Cl. 422-102.000.
Teel, Patrick. Trigger actuator. 4,514,923, Cl. 42-69.00R.
Teeter, Roger C. Load centering boot for inverse suspension. 4,515,152, Cl. 128-75.000.
Teetz, Volker, to Hoechst Aktiengesellschaft. Spiro-2-aza-alkane-3-carbonitriles, their preparation and their use. 4,515,960, Cl. 548-408.000.
Teetz, Volker: *See*—
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,515,803, Cl. 514-338.000.
Tektronix, Inc.: *See*—
Nakamura, Michael D., 4,516,042, Cl. 307-546.000.
Teldec Telefunken-Decca Schallplatten GmbH: *See*—
Borchard, Heinz; Knothe, Herbert; and Rybka, Bruno, 4,515,843, Cl. 428-64.000.
Teledyne Industries, Inc.: *See*—
Ward, John W., 4,515,169, Cl. 128-746.000.
Tellone, Mauro, to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A. Device for the automatic computer-control of the operation of a plurality of videorecorders. 4,516,166, Cl. 360-72.100.
Telly, Reginald O. Ball case for storing and organizing gage balls. 4,515,268, Cl. 206-305.000.

Terachi, Junichi: *See*—
Murata, Shirou; Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,002, Cl. 200-144.00C.
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,003, Cl. 200-144.00C.

Terada, Matsuaki: *See*—
Nakata, Yukio; Terada, Matsuaki; Suda, Kaoru; Morito, Motoyoshi; and Shiotsu, Osamu, 4,516,221, Cl. 364-900.000.

Teramachi, Hiroshi. Linear slide bearing. 4,515,413, Cl. 308-6.00C.

Teramachi, Hiroshi. Linear slide bearing. 4,515,416, Cl. 308-6.00C.

Terumo Corporation: *See*—
Shimizu, Masaki; Sudo, Tadashi; and Nomura, Takeo, 4,515,785, Cl. 424-195.100.

Teutsch, Jean G.; Deraedt, Roger; and Benzoni, Josette, to Roussel Uclaf. Steroids. 4,515,787, Cl. 514-180.000.

Texaco Inc.: *See*—
Elattar, Azza A., 4,515,901, Cl. 502-63.000.
Hermes, Chester E.; and Huang, Wann-Sheng, 4,515,215, Cl. 166-272.000.

Texas Instruments Incorporated: *See*—
Breedlove, Paul S.; and Moore, James H., 4,516,260, Cl. 381-51.000.
Chiu, Te-Long; and Lien, Jih-Chang, 4,514,897, Cl. 29-578.000.
Erickson, Donald A., 4,516,223, Cl. 365-175.000.
Hamilton, Stephen P., 4,516,218, Cl. 364-900.000.
Thompson, E. Earle, 4,516,200, Cl. 364-200.000.

Textilms Ag: *See*—
Durville, Gerard A.; and Bucher, Robert R., 4,515,186, Cl. 139-455.000.

Thaler, Rainer: *See*—
Schadlich, Fritz; Rieker, Werner; Thaler, Rainer; and Klingenstein, Klaus, 4,515,303, Cl. 227-131.000.

Thalmann, Alfred; and Reich, Fritz, to George Fischer Limited. Molded connection piece. 4,515,177, Cl. 137-318.000.

Theeuwes, Felix: *See*—
Urquhart, John; and Theeuwes, Felix, 4,515,585, Cl. 604-85.000.

Theijsmeijer, Frederik: *See*—
Roeder, Charles L.; Siefert, William J.; and Theijsmeijer, Frederik, 4,515,832, Cl. 427-233.000.

Thibodeaux, Patricia T. Hair curler with retractable retaining band. 4,515,171, Cl. 132-42.00R.

Thinschmidt, Hans: *See*—
Sauer, Anton; and Thinschmidt, Hans, 4,516,204, Cl. 364-200.000.

Thiokol Corporation: *See*—
Bell, Frank H., 4,515,080, Cl. 102-205.000.
Sparkman, David M., 4,515,317, Cl. 241-5.000.

Thomann, Roland; and Amann, Markus, to Polydrain, Inc. Slotted drainage grate with support. 4,515,498, Cl. 404-4.000.

Thomas, Edwin L.: *See*—
Frisbie, Richard C.; Houser, David E.; Morenus, Richard J.; and Thomas, Edwin L., 4,515,505, Cl. 409-163.000.
Hall, Douglas J.; Langley, Robert F.; and Thomas, Edwin L., 4,515,878, Cl. 430-5.000.

Thomas, Gareth J.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,515,969, Cl. 549-39.000.

Thomas, Glenn R.: *See*—
Wallace, James B.; and Thomas, Glenn R., 4,516,100, Cl. 335-160.000.

Thomas, Norman S., to Fairclough Civil Engineering Limited. Tunnel linings. 4,515,501, Cl. 405-153.000.

Thompson, David L.: *See*—
McDonald, Ray S.; Thompson, David L.; Rossing, Martin A.; and Hartlaub, Jerome T., 4,515,159, Cl. 128-419.0PG.

Thompson, E. Earle, to Texas Instruments Incorporated. Data communications system with host character terminal mode. 4,516,200, Cl. 364-200.000.

Thompson, Warren S.: *See*—
Taverna, Arthur R.; and Thompson, Warren S., 4,515,847, Cl. 428-107.000.

Thomson-CSF: *See*—
Doriath, Gerard; and Gaudry, Roger, 4,516,073, Cl. 324-244.000.
Fraise, Pierre, 4,516,271, Cl. 455-327.000.
Hartemann, Pierre; Meunier, Paul-Louis; and Jacobelli, Alain, 4,515,016, Cl. 73-517.00R.
Peynaud, Francois; Gosselin, Jean; Farcy, Andre ; and Grandvaux, Bernard, 4,516,226, Cl. 367-6.000.

Thuen, Judy: *See*—
Hinrichs, Richard J.; and Thuen, Judy, 4,515,545, Cl. 425-143.000.

Thurston, Kurt W. Road barricade flasher light combination. 4,516,109, Cl. 340-114.00B.

Tie Down Engineering, Inc.: *See*—
Wilson, Richard C., 4,514,970, Cl. 56-400.120.

Tiedeman, C. John, Jr.: *See*—
Dizek, Frederick A.; Vogel, Eric S.; Tiedeman, C. John, Jr.; and Herold, Robert A., 4,515,629, Cl. 75-0.50B.

Timm, Gerald W., to Dacomed Corporation. Nocturnal penile tumescence and rigidity monitor. 4,515,166, Cl. 128-694.000.

Tindall, Frank A. Ice cream can filling machine with content varigator. 4,515,190, Cl. 141-131.000.

Tinkle, Anthony R.: *See*—
Wener, Kenneth R.; and Tinkle, Anthony R., 4,516,227, Cl. 367-15.000.

Todoh, Hidemasa, to Fuji Xerox Co., Ltd. Thermal printer capable of reproducing halftone image. 4,516,135, Cl. 346-76.0PH.

Tohoku Metal Industries, Ltd.: *See*—
Nemoto, Michio; Yoshida, Kiyokazu; and Baba, Tetsuro, 4,516,101, Cl. 335-208.000.

Tokyo Electric Co. Ltd.: *See*—
Sakura, Yasuhiro; Nakajima, Yasushi; Tajima, Noriyasu; and Nimura, Hitoshi, 4,516,208, Cl. 364-466.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ajima, Takashi; Ohshima, Jiro; and Koshino, Yutaka, 4,515,642, Cl. 148-1.500.
Imai, Motomasa; Takahashi, Takashi; Furukawa, Osamu; and Kanai, Hideyuki, 4,516,105, Cl. 338-21.000.
Kizu, Shuji; Ikeda, Tsutomu; and Iwamoto, Masanori, 4,516,265, Cl. 382-48.000.
Kobayashi, Akio; Mizoguchi, Hitoshi; Ikeda, Hisatoshi; and Mayama, Hidekiyo, 4,516,006, Cl. 200-148.00A.
Kohyama, Mitsuaki, 4,515,106, Cl. 118-651.000.
Komatsu, Shigeru; and Inoue, Hiroshi, 4,516,147, Cl. 357-59.000.
Matsuo, Shuitsu; Imanishi, Yasuhiro; Nagashima, Hideo; Watanabe, Masaharu; Usami, Toshiro; and Muraoka, Hisashi, 4,515,755, Cl. 422-246.000.
Shirogami, Tamotsu; and Ueno, Mitsushi, 4,515,871, Cl. 429-34.000.
Sugimoto, Hiroshi, 4,516,074, Cl. 324-309.000.
Tomikawa, Masataka, 4,516,122, Cl. 340-825.500.
Yamakawa, Tsutomu; Nishikawa, Mineki; and Kihara, Tomohiko, 4,516,025, Cl. 250-252.100.
Yokota, Tsuneshi, 4,516,242, Cl. 372-29.000.
Yoneda, Hitoshi, 4,515,462, Cl. 355-4.000.

Tomcik, James D.: *See*—
Ching, Yau-Chau; and Tomcik, James D., 4,516,258, Cl. 381-31.000.

Tomihira, Shigeru: *See*—
Sakakibara, Mitsuhiko; Yoshizawa, Masao; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,515,922, Cl. 525-99.000.

Tomikawa, Masataka, to Tokyo Shibaura Denki Kabushiki Kaisha. Communication system with collision detection and forced collision. 4,516,122, Cl. 340-825.500.

Tominari, Noboru, to Tominari, Noboru; and Mikuni Kohyo Co., Inc. Circuit device for driving electromagnetically movable unit at high speed with single power source. 4,516,184, Cl. 361-152.000.

Tomlinson, Walter J., III: *See*—
Smith, Peter W.; and Tomlinson, Walter J., III, 4,515,429, Cl. 350-96.130.

Tomono, Noboru: *See*—
Fujii, Kunihisa; Tomono, Noboru; Watanabe, Hajime; and Miyakoshi, Yasushi, 4,516,099, Cl. 335-135.000.

Tomy Kogyo Co., Inc.: *See*—
Kozuka, Michihiro; and Tonokura, Masayuki, 4,515,571, Cl. 446-90.000.

Tong, Yit C.: *See*—
Patrick, James F.; Seligman, Peter; Tong, Yit C.; and Clark, Graeme M., 4,515,158, Cl. 128-419.00R.

Tonokura, Masayuki: *See*—
Kozuka, Michihiro; and Tonokura, Masayuki, 4,515,571, Cl. 446-90.000.

Toray Industries, Incorporated: *See*—
Inoue, Takehisa; and Miwa, Kishio, 4,515,605, Cl. 55-26.000.

Toray Silicone Company, Ltd.: *See*—
Fukayama, Miyoji; and Ichijo, Chikara, 4,515,834, Cl. 427-387.000.

Torick, Emil L., to CBS Inc. Triphonic sound system. 4,516,257, Cl. 381-4.000.

Torras, Robert M., to Kut-Kwick Corporation. Self-leveling vehicle seat mount. 4,515,337, Cl. 248-371.000.

Torras, Robert M., to Kut-Kwick Corporation. Slope mower. 4,515,392, Cl. 280-755.000.

Torrence, Paul F.; Johnston, Margaret I.; and Imai, Jiro, to United States of America, Health and Human Services. 2',5'-Riboadenylate-morpholinoadenylate nucleotides. 4,515,781, Cl. 514-46.000.

Toshiba Ceramics Co., Ltd.: *See*—
Matsuo, Shuitsu; Imanishi, Yasuhiro; Nagashima, Hideo; Watanabe, Masaharu; Usami, Toshiro; and Muraoka, Hisashi, 4,515,755, Cl. 422-246.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Nagashima, Kazuo, 4,516,212, Cl. 364-475.000.

Toshiba Silicone Co., Ltd.: *See*—
Otsuki, Masaaki; and Kida, Shinji, 4,515,979, Cl. 556-445.000.

Toth, John T.: *See*—
Fabris, Alfonso V.; Strickland, Robert M., Jr.; and Toth, John T., 4,516,156, Cl. 358-85.000.

Toyama, Teruhiko: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.

Toyo Jozo Kabushiki Kaisha: *See*—
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,515,941, Cl. 536-7.100.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Yamaoka, Tsuguo; and Fukuda, Mitsutoshi, 4,515,886, Cl. 430-270.000.

Toyo Tire & Rubber Company, Limited: *See*—
Otani, Kozo; and Yamada, Yoshio, 4,515,981, Cl. 560-50.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Tsujimura, Isao; and Yoshimi, Takani, 4,514,892, Cl. 29-568.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Suzuki, Yukio; Sato, Kunihiko; and Muramatsu, Motoyasu, 4,515,131, Cl. 123-491.000.
Takahashi, Yoshinobu, 4,515,674, Cl. 204-292.000.

Tsuchiya, Yasuhiro; and Ozawa, Hitoshi, 4,515,112, Cl. 123-41.840.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kinbara, Hiroji; Matsui, Kazuma; Hattori, Yoshiyuki; Hayakawa, Hideyuki; Takizawa, Masaaki; Tamura, Masaru; and Jufuku, Yasunobu, 4,515,575, Cl. 474-13.000.
Moriyama, Masakazu; and Saito, Takao, 4,516,207, Cl. 364-424.000.

Toyota Motor Co., Ltd.: *See—*
Moriyama, Masakazu; Shinohara, Toshio; Hirano, Kazuo; and Makino, Fumio, 4,516,121, Cl. 340-825.050.

Trinquier, Jacques: *See—*
Jouffrey, Bernard; Trinquier, Jacques; and Franceschi, Jean-Luc, 4,516,026, Cl. 250-310.000.

Trio Kabushiki Kaisha: *See—*
Yanagihara, Masaki; and Iimura, Takashi, 4,516,078, Cl. 328-167.000.

Tritter, Stephen D. Function generators. 4,516,107, Cl. 338-89.000.

Trommen, Hartmut: *See—*
Rother, Bruno; and Trommen, Hartmut, 4,515,547, Cl. 425-215.000.

Trouillet, Jean, to Jeumont-Schneider Corporation. Linking arrangement for a shaft and a fly-wheel. 4,515,495, Cl. 403-336.000.

Trumper, Thomas; Schoop, Gunther-Dietmar; Borgschulte, Fritz; and Krummnack, Friedrich, to Gewerkschaft Eisenhutte Westfalia. Rack assembly. 4,515,410, Cl. 299-43.000.

Truskalo, Walter, to RCA Corporation. Synchronized switching regulator for a multiple scanning frequency video monitor. 4,516,169, Cl. 358-190.000.

TRW Inc.: *See—*
Findakly, Talal K., 4,515,428, Cl. 350-96.120.
MacKenzie, Burton T., 4,515,993, Cl. 174-102.00R.

Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission mechanism for motorcycles. 4,515,038, Cl. 74-606.00R.

Tsubouchi, Kazuo: *See—*
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Sugai, Kazuyoshi, 4,516,049, Cl. 310-313.00A.

Tsuchikawa, Haruo; and Kai, Junichi, to Fujitsu Limited. Scanning electron beam exposure system. 4,516,030, Cl. 250-492.200.

Tsuchiya, Yasuhiro; and Ozawa, Hitoshi, to Toyota Jidosha Kabushiki Kaisha. Aluminum alloy cylinder block. 4,515,112, Cl. 123-41.840.

Tsuda, Mamoru: *See—*
Asai, Koichi; Tsuda, Mamoru; Oe, Kunio; and Muto, Yasuo, 4,515,507, Cl. 414-226.000.

Tsuji, Sadahiko: *See—*
Takahashi, Sadatoshi; Tsuji, Sadahiko; Tajima, Akira; Asano, Toshiaki; and Minami, Setsuo, 4,515,446, Cl. 350-427.000.

Tsujimura, Isao; and Yoshimi, Takani, to Toyoda Koki Kabushiki Kaisha. Machine tool. 4,514,892, Cl. 29-568.000.

Tsujimura, Kanji. Guard for chain wheel. 4,515,386, Cl. 280-289.00G.

Tsukagoshi, Sadayuki: *See—*
Horikoshi, Hiroshi; Arai, Akio; Tsukagoshi, Sadayuki; and Sakamoto, Junichi, 4,515,365, Cl. 273-25.000.

Tsuneno, Tatsuro; and Takaku, Masaaki, to Kao Corporation. Process for preparing boric esters of glycerol fatty acid esters. 4,515,725, Cl. 260-410.700.

Tsurumi, Michio; and Lee, Do I., to Dow Chemical Company, The. Crosslinked latexes encapsulated with linear polymers. 4,515,914, Cl. 523-201.000.

Tsuzuki, Hiroyoshi, to Canon Kabushuki Kaisha. Data inserting device for camera. 4,515,452, Cl. 354-106.000.

Tucker, Theodore W., to Control Data Corporation. E beam stage with below-stage X-Y drive. 4,516,029, Cl. 250-442.100.

Turner, William: *See—*
Werbel, Leslie M.; Colbry, Norman; Turner, William; and Worth, Donald F., 4,515,793, Cl. 514-252.000.

Turney, William J., to Motorola, Inc. Fast lock PLL having out of lock detector control of loop filter and divider. 4,516,083, Cl. 331-1.00A.

Turrill, Frank H.: *See—*
Hettinger, William P., Jr.; Turrill, Frank H.; Rozman, George J.; and Beck, H. Wayne, 4,515,680, Cl. 208-87.000.

Tuttle, Mark: *See—*
Friesen, Dwayne; Babcock, Walter C.; and Tuttle, Mark, 4,515,906, Cl. 521-28.000.

Tuyet-Van, Hoang T. Sock. 4,514,863, Cl. 2-240.000.

Tyler, Charles E., Jr. Fire resistant lap protection blanket. 4,514,870, Cl. 5-485.000.

Tyler, Derek E.; and Yarwood, John C., to Olin Corporation. Process of continuously treating an alloy melt. 4,515,630, Cl. 75-53.000.

Tyler Refrigeration Corporation: *See—*
Ibrahim, Fayez F., 4,514,988, Cl. 62-82.000.

Tyszkiewicz, Theodore J.: *See—*
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,515,987, Cl. 568-433.000.

UBE Industires, Ltd.: *See—*
Yajima, Seishi, deceased; Noda, Akiko, heir; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamaura, Takemi, 4,515,742, Cl. 264-63.000.

Uchida, Hiroyuki: *See—*
Imakoshi, Shigeyoshi; Soda, Yutaka; Uchida, Hiroyuki; Sugita, Junkichi; Takino, Hiroshi; Sekiya, Tetsuo; and Suyama, Hideo, 4,516,179, Cl. 360-113.000.

Uchida, Isamu, deceased (by Fujii, Kazuko Uchida and Chigusa, heiresses); Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, to Laurel Bank Machine Co., Ltd. Automatic money receiving and disbursing machine. 4,516,015, Cl. 235-379.000.

Uda, Junji; Yamamoto, Tsuneo; and Kosugi, Takumi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Polyamide acid composition for preparing polyimide. 4,515,915, Cl. 524-87.000.

Udall, Raymond E., to Southern Chemical Products Company. Liquid dispenser, valve therefor and process of producing the valve. 4,515,294, Cl. 222-105.000.

Uehara, Masaru: *See—*
Adachi, Kiyoshi; Uehara, Masaru; Kitagawa, Hiroshi; Kojima, Hirotaka; and Sato, Masaaki, 4,514,965, Cl. 53-553.000.

Uemura, Michihiko: *See—*
Kambara, Toru; Uemura, Michihiko; and Iwanaga, Takeya, 4,516,090, Cl. 333-141.000.

Ueno, Mitsushi: *See—*
Shirogami, Tamotsu; and Ueno, Mitsushi, 4,515,871, Cl. 429-34.000.

Ueno, Shoji: *See—*
Masuda, Isao; Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Ueno, Shoji, 4,516,163, Cl. 360-32.000.

Ugine Aciers: *See—*
Jacquemin, Claude; Provost, Florent; and Seinera, Andre , 4,515,560, Cl. 432-80.000.

Ulvr, Joseph: *See—*
Corvari, John; Ulvr, Joseph; and Alas, Raigo, 4,516,264, Cl. 382-46.000.

Umeda, Tadashi: *See—*
Miyoshi, Hideo; Umeda, Tadashi; and Aoki, Takashi, 4,515,465, Cl. 355-14.00C.

Underhill, Kenneth R., to Sperry Corporation. In-line rectangular baler. 4,514,968, Cl. 56-341.000.

Union Camp Corporation: *See—*
Frihart, Charles R.; and Veazey, Richard L., 4,515,939, Cl. 528-339.300.

Union Carbide Corporation: *See—*
Churma, Theodore; Latimer, Elwood D., Jr.; and Vicik, Stephen J., 4,515,745, Cl. 264-211.000.
Kamp, Ewald A., 4,516,268, Cl. 383-63.000.
Nowobilski, Jeffert J.; and Kather, Kenneth C., 4,515,397, Cl. 285-47.000.

Union Oil Company of California: *See—*
Deering, Roland F., 4,515,679, Cl. 208-11.00R.
Lutzens, William W., 4,514,905, Cl. 33-125.00B.

Uniroyal, Inc.: *See—*
Cathey, Thaddeus F.; Gaynor, John C.; and Nelson, Rodney J., 4,515,577, Cl. 474-204.000.

Unisearch Limited: *See—*
Garde, Peter, 4,516,080, Cl. 330-3.000.

United States of America
Agriculture: *See—*
Laurent, Sebastian M.; and Pond, Wilson G., 4,515,780, Cl. 424-154.000.
Air Force: *See—*
Taverna, Arthur R.; and Thompson, Warren S., 4,515,847, Cl. 428-107.000.
Zahn, Robert L., 4,515,001, Cl. 72-323.000.
America Postal Service: *See—*
Corvari, John; Ulvr, Joseph; and Alas, Raigo, 4,516,264, Cl. 382-46.000.
Army: *See—*
Bayha, William T.; Borowick, John; Stern, Richard A.; and Babbitt, Richard W., 4,516,131, Cl. 343-785.000.
Bly, Vincent T., 4,515,443, Cl. 350-396.000.
Gray, Billy C., 4,515,043, Cl. 81-57.220.
Sayles, David C., 4,515,912, Cl. 523-456.000.
Energy: *See—*
Fox, Richard J., 4,515,474, Cl. 356-44.000.
Herman, Raymond L., 4,515,007, Cl. 73-38.000.
Pardini, John A.; Brubaker, Robert C.; and Rusnak, John J., 4,515,750, Cl. 376-446.000.
Riggan, William C., 4,516,028, Cl. 250-370.000.
Simpson, Marc L.; and McNeilly, David R., 4,516,020, Cl. 250-214.00L.
Zimmermann, Eugene L.; and Kania, Don R., 4,515,173, Cl. 137-68.00R.
Health and Human Services: *See—*
Torrence, Paul F.; Johnston, Margaret I.; and Imai, Jiro, 4,515,781, Cl. 514-46.000.
National Aeronautics and Space Administration: *See—*
Alario, Joseph P.; Brown, Richard F.; and Kosson, Robert L., 4,515,207, Cl. 165-1.000.
Buehler, Martin G., 4,516,071, Cl. 324-158.00R.
Krieg, Herman C., Jr., 4,515,751, Cl. 422-86.000.
Navy: *See—*
Fenneman, David B.; Rinehart, Larry F.; and Hardesty, Leonard W., Jr., 4,516,077, Cl. 324-425.000.
Hannmann, Ralph A., Jr.; and Higginbotham, James F., 4,515,065, Cl. 91-363.00A.
Slump, William R., 4,516,111, Cl. 340-347.0DA.

U.S. Philips Corporation: *See—*
Burgin, Kenneth N., 4,515,996, Cl. 179-81.00B.
Doyen, Daniel, 4,516,096, Cl. 333-219.000.
Goscianski, Michel; and de Ronde, Francois, 4,516,089, Cl. 333-135.000.
Harding, Geoffrey; and Klotz, Erhard, 4,516,261, Cl. 382-6.000.
Hooft van Huijsduijnen, Jozef A. M., 4,516,051, Cl. 313-446.000.
Linde, Rolf; and Klotz, Erhard, 4,516,252, Cl. 378-23.000.
Shannon, John M.; Hoeberechts, Arthur M. E.; and Van Gorkom, Gerardus G. P., 4,516,146, Cl. 357-52.000.

Smit, Hermanus, 4,515,427, Cl. 339-177.00E.

United Technologies Corporation: *See—*
Dizek, Frederick A.; Vogel, Eric S.; Tiedeman, C. John, Jr.; and Herold, Robert A., 4,515,629, Cl. 75-0.50B.
Doman, Glidden S., 4,515,525, Cl. 416-11.000.
Levengood, James L., 4,515,526, Cl. 416-96.00R.
Melton, Lynn A., 4,515,896, Cl. 436-2.000.

Unitika, Ltd.: *See—*
Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, 4,515,691, Cl. 210-274.000.

Universal Pioneer Corporation: *See—*
Kanamaru, Hitoshi, 4,516,160, Cl. 358-326.000.

University of California, The Regents of the: *See—*
Deamer, David W., 4,515,736, Cl. 264-4.300.
Vigil, Samuel A.; and Spielman, Rick B., 4,516,043, Cl. 310-11.000.

University of Maine, Board of Trustees of the: *See—*
Carr, Edward F., 4,515,206, Cl. 165-1.000.

University of Technology: *See—*
Pugh, Stuart; Smith, Douglas G.; Lee, Chee M.; Parr, Leslie R.; Birkett, John N.; Stibbs, Richard G.; and Tai, Tet C., 4,515,333, Cl. 248-122.000.

University Patents, Inc.: *See—*
Besic, Frank C., 4,515,770, Cl. 424-49.000.

Upjohn Company, The: *See—*
Schadewald, Frederic H., 4,515,482, Cl. 366-136.000.

Upson, Lawrence L.: *See—*
Otterstedt, Jan-Erik A.; Jaras, Sven G.; Pudas, Roland; and Upson, Lawrence L., 4,515,903, Cl. 502-68.000.

Ura, Masaaki: *See—*
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,515,628, Cl. 71-111.000.

Urbach, Hansjorg: *See—*
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,515,803, Cl. 514-338.000.

Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. System for parenteral administration of agent. 4,515,585, Cl. 604-85.000.

Usami, Toshiro: *See—*
Matsuo, Shuitsu; Imanishi, Yasuhiro; Nagashima, Hideo; Watanabe, Masaharu; Usami, Toshiro; and Muraoka, Hisashi, 4,515,755, Cl. 422-246.000.

Ushikubo, Masao, to Olympus Optical Co., Ltd. Cap and a cap opening and closing device. 4,515,286, Cl. 220-314.000.

Utaka, Katsuyuki; Sakai, Kazuo; and Akiba, Shigeyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Distributed feedback semiconductor laser. 4,516,243, Cl. 372-96.000.

Utsumi, Isamu: *See—*
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.000.

Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, to N. V. Bekaert S.A. Process for forming a catalyst and the catalytic product produced by the process. 4,515,905, Cl. 502-309.000.

Vackier, Leo N., to AGFA-Gevaert N.V. Apparatus for transferring electrophotographic images. 4,515,461, Cl. 355-3.0TR.

Valet, Gunter; Ruhenstroth-Bauer, Gerhard; Wunsch, Erich; and Moroder, Luis. Compounds for determining the pH value in the interior of a cell. 4,515,730, Cl. 260-465.00D.

Vallak, Enn; and Vallak, Hannes, to International Ferrox Co., Establishment. Ingot mould having a hot-top inside the upper part of the mould. 4,515,341, Cl. 249-106.000.

Vallak, Hannes: *See—*
Vallak, Enn; and Vallak, Hannes, 4,515,341, Cl. 249-106.000.

Vallejos, Jean-Claude: *See—*
Christidis, Yani; and Vallejos, Jean-Claude, 4,515,970, Cl. 549-79.000.

Vallourec: *See—*
Plaquin, Bernard, 4,515,020, Cl. 73-761.000.

Valtion Teknillinen Tutkimuskeskus: *See—*
Orjala, Markku, 4,515,088, Cl. 110-110.000.

Van Dyk & Company Inc.: *See—*
Conner, Donald E.; and Klein, Kenneth, 4,515,774, Cl. 424-59.000.

Van Becelaere, Robert M., to Ruskin Manufacturing Company. Damper with integral mounting means. 4,515,068, Cl. 98-1.000.

van den Boom, Johannes: *See—*
Blatt, Georg; van den Boom, Johannes; Kuipers, Geert; and Hollerweger, Heinz, 4,515,239, Cl. 181-290.000.

van der Lely, Cornelis. Tractor having guidance system. 4,515,221, Cl. 172-3.000.

van der Lely, Cornelis. Soil cultivating implements. 4,515,222, Cl. 172-68.000.

VanDerLinden, Roy E.; and Francis, John H., to Frederick Manufacturing Company. Multi-speed drive. 4,515,028, Cl. 74-191.000.

Van Dusseldorp, C. Peter: *See—*
Moore, Jerry R.; and Van Dusseldorp, C. Peter, 4,515,423, Cl. 339-28.000.

Vanek, Jay D.: *See—*
Edmunds, Robert H.; and Vanek, Jay D., 4,515,179, Cl. 137-543.130.

Vanelli, Johnny, to Optimum Manufacturing Inc. Combined lighter and mouth spray. 4,515,556, Cl. 431-253.000.

van Esch, Hendrikus J.: *See—*
Eertink, Bastiaan B. B.; and van Esch, Hendrikus J., 4,516,019, Cl. 250-214.0RC.

Van Gompel, James; and Akey, Ronald R., to N P Marketing Corporation. Pallet cargo restraining device. 4,515,506, Cl. 410-46.000.

Van Gorkom, Gerardus G. P.: *See—*
Shannon, John M.; Hoeberechts, Arthur M. E.; and Van Gorkom, Gerardus G. P., 4,516,146, Cl. 357-52.000.

Van Grouw, Samual J.; and Smith, Richard D. Clean burning grate for fireplaces and wood stoves. 4,515,147, Cl. 126-163.00R.

VanHulle, Glenn J.: *See—*
Blake, Jon R.; Knutson, Richard K.; and VanHulle, Glenn J., 4,515,824, Cl. 426-554.000.

Van Leirsburg, Dean A.: *See—*
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,515,757, Cl. 423-54.000.

Vanlerberghe, Guy; and Sebag, Henri, to Societe Anonyme dite: L'Oreal. Polyhydroxyl non-ionic surfactant, process for preparing the same and cosmetic composition containing the same. 4,515,775, Cl. 424-70.000.

Van Loveren, Augustinus G.: *See—*
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,515,712, Cl. 252-522.00R.

van Os, Cornelis J., to Noord-Nederlandsche Machinefabriek B.V. Perstaltic pump. 4,515,536, Cl. 417-394.000.

Van Papeveld, Piet: *See—*
Beck, Alfred; and Van Papeveld, Piet, 4,514,931, Cl. 49-21.000.

van Poele, Gerard J.: *See—*
Piepers, Harry C.; and van Poele, Gerard J., 4,515,670, Cl. 204-199.000.

van Raalte, John A.; and Riddle, George H. N., to RCA Corporation. Video disc player with compensation for stylus holder mechanical resonance. 4,516,232, Cl. 369-126.000.

Vapor Corporation: *See—*
Edmunds, Robert H.; and Vanek, Jay D., 4,515,179, Cl. 137-543.130.

Varallo, Thomas P.; Ervine, Albert W. G.; Duffy, Joseph J.; and Olson, Edwin G., to Du Pont de Nemours, E. I., and Company. Vacuum transfer apparatus for packing layers of articles in a container. 4,514,956, Cl. 53-148.000.

Varga, Laszlo ; Krekacs, Sandor; Latorcai, Janos; Palfi, Zoltan; and Fledrich, Istvan, to Budapesti Muszaki Egyetem. Method for removing moisture adhered to surfaces of bodies and for simultaneously adjusting the surface temperature of the bodies. 4,514,911, Cl. 34-22.000.

Vargas, Alfredo P., to South American Placers, Inc. Process for the selective separation of base metal sulfides and oxides contained in an ore. 4,515,688, Cl. 209-167.000.

Varian Associates, Inc.: *See—*
Russo, Carl J., 4,516,050, Cl. 313-359.100.

Vaughn, Cecil C.: *See—*
Austin, Jon W.; and Vaughn, Cecil C., 4,515,589, Cl. 604-122.000.

Vaughn, Edward A., to Allied Corporation. Formation of nonwoven webs or batts from continuous filament tow or yarn strands. 4,514,880, Cl. 19-0.350.

Veazey, Richard L.: *See—*
Frihart, Charles R.; and Veazey, Richard L., 4,515,939, Cl. 528-339.300.

VEB Ingenieurbuero fuer Meliorationen: *See—*
Nolting, Rolf; and Siniza, Bernhard, 4,515,175, Cl. 137-107.000.

Veda, Inc.: *See—*
Buschbom, Floyd E.; and Hansen, Glen D., 4,514,978, Cl. 60-426.000.

Verbatim Corporation: *See—*
Street, Jeffrey B., 4,516,176, Cl. 360-75.000.

Vercon Inc.: *See—*
MacLaughlin, Donald N.; and Fortuna, Vincent E., 4,515,651, Cl. 156-423.000.

Vershinin, Sergei V.: *See—*
Maidanik, Jury F.; Vershinin, Sergei V.; Kholodov, Valery F.; and Dolgirev, Jury E., 4,515,209, Cl. 165-104.220.

Vetter, Heinz: *See—*
Kolbe, Klaus; Hellmann, Walter; Krajec, Otmar; Schikowsky, Hartmut; and Vetter, Heinz, 4,515,648, Cl. 156-196.000.

Vicik, Stephen J.: *See—*
Churma, Theodore; Latimer, Elwood D., Jr.; and Vicik, Stephen J., 4,515,745, Cl. 264-211.000.

Victor Company of Japan: *See—*
Masuda, Isao; Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Ueno, Shoji, 4,516,163, Cl. 360-32.000.

Victor Company of Japan, Ltd.: *See—*
Matsumoto, Ikuo, 4,515,856, Cl. 428-323.000.
Sigiyama, Hiroyuki; Sakurai, Masaki; Abe , Ryozo; and Yoshihara, Kenji, 4,516,161, Cl. 358-342.000.

Victor Hasselblad Aktiebolag: *See—*
Dahlgren, Lennart G. O., 4,515,454, Cl. 354-287.000.

Videocolor S.A.: *See—*
Cormio, Ignazio, 4,515,568, Cl. 445-3.000.

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Visinand, Jean-Claude. Bathtub. 4,514,868, Cl. 4-541.000.

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Vogel, Eric S.: *See—*
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Bany, Peter-Michael; Berger, Wolfgang; Bettge, Hans; Bialkowski, Gunter; Rozek, Rafl; Steinemer, Norbert; and Volkmann, Claus-Jurgen, 4,516,004, Cl. 200-144.00B.

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Rathe, Robert A.; and Volkmann, Thomas J., 4,514,939, Cl. 52-118.000.

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Markov, Vladimir A.; Filatov, Vladimir N.; Kernasovsky, Ilya S.; and Gorina, Ljudmila V., 4,515,254, Cl. 188-371.000.

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Wagner, David L., to Boeing Company, The. Escapement orienting mechanism. 4,515,260, Cl. 193-44.000.

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Walker, Robert F.: *See—*
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Wallace, David R.; Korba, James M.; Matson, James E.; and Lynnworth, Lawrence C., to Panametrics, Inc. Intervalometer time measurement apparatus and method. 4,515,021, Cl. 73-861.270.

Wallace, James B.; and Thomas, Glenn R., to Westinghouse Electric Corp. Mechanical interlock for vertically mounted circuit breakers. 4,516,100, Cl. 335-160.000.

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Wallach, Walter A., Jr.: *See—*
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Walling, John B. Single action pneumatic powered spring retractable pump. 4,515,532, Cl. 417-318.000.

Walsh, Dennis E.; and Green, Gary J., to Mobil Oil Corporation. Enhancement of solid fuel combustion by catalyst deposited on a substrate. 4,515,092, Cl. 110-347.000.

Walter, Thomas J.: *See—*
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Walther, Karl-Heinz, to Pfaff Industriemaschinen GmbH. Device for driving a sewing machine. 4,515,098, Cl. 112-274.000.

Wanat, David J.: *See—*
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Wang, Roger C.: *See—*
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,514,954, Cl. 53-53.000.

Wank, Joachim: *See—*
Kleiner, Frank; Kubens, Rolf; Reese, Eckart; and Wank, Joachim, 4,515,925, Cl. 525-439.000.

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Difflipp, Kurt; and Wanke, Johannes, 4,515,078, Cl. 101-157.000.

Wapperom, Pieter, to Rontgen Technische Dienst B.V. Movable projector unit for gamma radiation for welding control purposes with pipe-lines and the like. 4,516,256, Cl. 378-60.000.

Ward, John W., to Teledyne Industries, Inc. Differential latency audiometer. 4,515,169, Cl. 128-746.000.

Ward, Michael D.: *See—*
Brazdil, James F., Jr.; Marritt, William A.; and Ward, Michael D., 4,515,732, Cl. 260-465.600.

Warner, David. Pants presser with spring gripping device. 4,514,918, Cl. 38-36.000.

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Wruk, Thomas J., 4,515,251, Cl. 188-171.000.

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Hunter, James R., 4,515,355, Cl. 269-234.000.

Warren, Conrad K., II. Molecular diffuser assembly. 4,515,134, Cl. 123-557.000.

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Waschulewski, Hans-Georg: *See—*
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Wasco Products, Inc.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,514,943, Cl. 52-200.000.

Watanabe, Fumio; Mizuguchi, Yoshihiko; and Yamada, Matsuichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Beam waveguide feeder. 4,516,128, Cl. 343-761.000.

Watanabe, Hajime: *See—*
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Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,515,941, Cl. 536-7.100.

Watanabe, Isamu: *See—*
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Watanabe, Masaharu: *See—*
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Watthey, Jeffrey W. H., to Ciba-Geigy Corporation. Tetracyclic heterocycles and antidepressant compositions thereof. 4,515,792, Cl. 514-214.000.

Webb, Anthony J.: *See—*
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Weber, Jochen: *See—*
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Weber, Jurgen: *See*—
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Weber, Richard E., Sr. Snagged fish hook release device. 4,514,926, Cl. 43-17.200.

Wei, Yun-Song. Dual-inclined lifters for autogenous mills. 4,515,319, Cl. 241-284.000.

Weido, Vincent C.; and Grissom, David, to NL Industries, Inc. Stuck point indicating device with linear sensing means. 4,515,010, Cl. 73-151.000.

Weimer, Eugen; and Muller, Gerhard, to Carl-Zeiss-Stiftung. Optical adjustment device. 4,515,447, Cl. 350-527.000.

Welch, Albert B., to LTV Aerospace and Defense Co. Agile receiver for a scanning laser radar. 4,515,472, Cl. 356-5.000.

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Wells, Thomas R.: *See*—
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Welsh, Richard E., to Dentsply Research & Development Corp. Dental mixing and extrusion capsule. 4,515,267, Cl. 206-219.000.

Wener, Kenneth R.; and Tinkle, Anthony R., to Marathon Oil Company. Subocean bottom explosive seismic system. 4,516,227, Cl. 367-15.000.

Wentz, John L., to Westinghouse Electric Corp. Dielectric polarizer for high average and high peak power operation. 4,515,441, Cl. 350-395.000.

Wentzel, Robert M.: *See*—
Durkee, David B.; Koller, James P.; and Wentzel, Robert M., 4,516,140, Cl. 346-140.00R.

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Werth, Carl H., Jr., to Werth Engineering, Inc. Automatic adjusting gib assembly. 4,515,414, Cl. 308-3.00R.

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Werth, Carl H., Jr., 4,515,414, Cl. 308-3.00R.

Wesley, John: *See*—
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West, David E., to Magnetic Peripherals Inc. Method for verifying servo data. 4,516,162, Cl. 360-25.000.

West, Frank M. Automobile horn circuit and replacement part therefor. 4,516,001, Cl. 200-61.540.

Western Geophysical Company of America: *See*—
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Westinghouse Electric Corp.: *See*—
Caputo, William R., 4,515,247, Cl. 187-29.00R.
Ferlan, Stephen J.; and Gesinski, Leonard T., 4,514,889, Cl. 29-229.000.
North, William E.; Holden, Paul C.; and Hultgren, Kent G., 4,515,523, Cl. 415-115.000.
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Westwood, Donald C.: *See*—
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Whatley, Roger A.: *See*—
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Wheeler, Louis B., to Combustion Engineering, Inc. Apparatus for installing a tension coil spring. 4,514,888, Cl. 29-227.000.

White, Iain S., to Safety Devices (Engineering) Limited. Apparatus for visually displaying the load-moment, axle-load, or payload of a vehicle. 4,516,116, Cl. 340-685.000.

Whiteman, John D.: *See*—
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Wick, Alexander E.; and Binet, Jean, to Synthelabo. 3-Phenoxypropan-2-ol derivatives for treating glaucoma. 4,515,814, Cl. 514-652.000.

Wideman, Lawson G.; and Kuczkowski, Joseph A., to Goodyear Tire & Rubber Company, The. Decarboxylation of rosin acids. 4,515,713, Cl. 260-106.000.

Wiebus, Ernst: *See*—
Bernhagen, Wolfgang; Falk, Volker; Springer, Helmut; Weber, Jurgen; Wiebus, Ernst; and Kniep, Claus, 4,515,986, Cl. 564-471.000.

Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Macrocyclic carbonates and organoleptic uses thereof. 4,515,712, Cl. 252-522.00R.

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Wiens, William S. Variable speed transmission. 4,515,576, Cl. 474-29.000.

Wilfong, Evan C.; and Anno, Tesfaye, to Equipment Systems & Devices, Inc. Coin slide. 4,515,262, Cl. 194-1.00G.

Wilkening, Donald W. Fireplace door. 4,515,146, Cl. 126-140.000.

Willcox, Charles R., to AT&T Teletype Corporation. Thermal print head. 4,516,136, Cl. 346-76.0PH.

Wille, Marc, to N. V. Raychem S. A. Coating recoverable sheets. 4,515,831, Cl. 427-223.000.

Willers, Arthur G.: *See*—
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Willette Corporation: *See*—
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Williams, Conrad F.: *See*—
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Williams, John P., to British Gas Corporation. Apparatus for applying heat to a portion of a pipeline. 4,515,562, Cl. 432-225.000.

Williams, Roy L. Apparatus for whitewalling vehicle tires. 4,515,200, Cl. 157-13.000.

Willis, Donald H., to RCA Corporation. Video signal processor with automatic kinescope white balance and beam current limiter control systems. 4,516,152, Cl. 358-29.000.

Willis, Paul E.: *See*—
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Wilson, Bradford W. Environmental curtain. 4,515,202, Cl. 160-332.000.

Wilson, Burton D.: *See*—
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Wilson, David A.: *See*—
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Wilson, Jay R. Trolling motor foot control. 4,515,567, Cl. 440-7.000.

Wilson, Richard C., to Tie Down Engineering, Inc. Rake attachment. 4,514,970, Cl. 56-400.120.

Windischbauer, Florian. Apparatus for the constrained actuation of the clamping system of filling-yarn insertion devices in shuttleless weaving machines. 4,515,185, Cl. 139-446.000.

Wingerd, Winston H.: *See*—
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Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., to Ford Motor Company. Pyrolytic conversion of plastic and rubber waste to hydrocarbons with basic salt catalysts. 4,515,659, Cl. 201-2.500.

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Winter, Heinz W.: *See*—
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Winter-Moore, Peter H.; and Sanchez, Fernando J. Dentistry. 4,515,565, Cl. 433-221.000.

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Witman, Mark W., to Mobay Chemical Corporation. Polycarbonate compositions having a high impact strength and melt flow rate. 4,515,921, Cl. 525-67.000.

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Wittkampf, Frederik H. M.; and Boute, Willem, to Vitafin N.V. Dual chamber pacemaker system with V-A time measurement apparatus and method. 4,515,161, Cl. 128-419.0PG.

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Wolde-Michael, Girma, to Donaldson Company, Inc. Gas, fluid and mineral solids separation and reclamation system. 4,515,607, Cl. 55-166.000.

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Wood, John C.: *See*—
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Wood, Roy W.: *See*—
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Woodfill, Ronald C. Pressure measuring device for bottles. 4,515,019, Cl. 73-756.000.

Woodhull, William M. Energy transducer for hydraulic wind power conversion system and instrumentation therefor. 4,515,529, Cl. 417-63.000.

Woodward, Robert B.: *See*—
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Worth, Donald F.: *See*—
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Wrobleski, James T., to Monsanto Company. Process for producing maleic anhydride. 4,515,973, Cl. 549-259.000.

Wruk, Thomas J., to Warner Electric Brake & Clutch Company. Electromagnetic brake with improved armature mounting. 4,515,251, Cl. 188-171.000.

Wu, Jenn-Ming; Cannon, Warren R.; and Panzera, Carlino, to Johnson & Johnson Dental Products Company. Castable glass-ceramic composition useful as dental restorative. 4,515,634, Cl. 106-35.000.

Wuerzer, Bruno: *See*—
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Wulfing, James J.; and Rood, Robert M., to Minnesota Mining and Manufacturing Company. Tape roller for a tape cassette. 4,515,330, Cl. 242-197.000.

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Wunsch, Erich: *See*—
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Xerox Corporation: *See*—
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Yagasaki, Toshiaki: *See*—
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Yajima, Mantaro, heir: *See*—
Yajima, Seishi, deceased; Noda, Akiko, heir; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamaura, Takemi, 4,515,742, Cl. 264-63.000.

Yajima, Seishi, deceased (by Yajima, Mantaro, heir); Noda, Akiko, heir; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamaura, Takemi, to UBE Industires, Ltd. Continuous inorganic fibers and process for production thereof. 4,515,742, Cl. 264-63.000.

Yamada, Matsuichi: *See*—
Watanabe, Fumio; Mizuguchi, Yoshihiko; and Yamada, Matsuichi, 4,516,128, Cl. 343-761.000.

Yamada, Yasuyoshi; and Hiraga, Ryozo, to Canon Kabushiki Kaisha. Apparatus for processing a signal for aligning. 4,515,481, Cl. 356-400.000.

Yamada, Yoshio: *See*—
Otani, Kozo; and Yamada, Yoshio, 4,515,981, Cl. 560-50.000.

Yamagata, Shinji: *See*—
Murata, Shirou; Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,002, Cl. 200-144.00C.
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,003, Cl. 200-144.00C.

Yamagiwa, Akira: *See*—
Matsuzaki, Isokazu; Yamagiwa, Akira; Watanabe, Yutaka; Matsumoto, Takashi; and Yabe, Katsumi, 4,516,039, Cl. 307-455.000.

Yamaguchi, Izumi, to Kabushiki Kaisha Nagaoka. Level with two guide frames and ball in each. 4,514,908, Cl. 33-365.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Kanamori, Takashi, 4,515,236, Cl. 180-227.000.
Katsuoka, Tatsuzo, 4,515,127, Cl. 123-430.000.

Yamaichi Electric Mfg. Co., Ltd.: *See*—
Nakano, Hidetaka, 4,515,425, Cl. 339-75.0MP.
Sakurai, Toshihiro, 4,515,424, Cl. 339-75.0MP.

Yamakawa, Tsutomu; Nishikawa, Mineki; and Kihara, Tomohiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for controlling scintillation camera. 4,516,025, Cl. 250-252.100.

Yamamoto, Akihiko: *See*—
Sakurai, Yukio; and Yamamoto, Akihiko, 4,515,208, Cl. 165-43.000.

Yamamoto, Akira: *See*—
Motomura, Kenichi; Ogawa, Hiroshi; Yamamoto, Akira; and Hagita, Noriyuki, 4,515,197, Cl. 152-209.00R.

Yamamoto, Katsuhiro; Matsumoto, Katsuo; and Okada, Yoshiyuki, to Nitto Electric Industrial Co., Ltd. Electrode pad. 4,515,162, Cl. 128-640.000.

Yamamoto, Kazuhito; and Takenaka, Toshio, to Sumitomo Chemical Company, Limited. Adhesive composition. 4,515,917, Cl. 524-178.000.

Yamamoto, Kiwamu; and Tanaka, Tsuyoshi, to Shinko Electric Co., Ltd. Driverless guided vehicle. 4,515,235, Cl. 180-168.000.

Yamamoto, Takaaki; and Kawai, Yasuhiro, to Fuji Photo Film Co., Ltd. Image scanning apparatus. 4,516,142, Cl. 346-160.000.

Yamamoto, Tomoyuki: *See*—
Shikama, Takashi; Yamamoto, Tomoyuki; and Yokota, Atsuo, 4,516,054, Cl. 315-71.000.

Yamamoto, Toru: *See*—
Takeo, Tadashi; Yamamoto, Toru; and Yamashito, Sachihiro, 4,515,521, Cl. 414-735.000.

Yamamoto, Tsuneo: *See*—
Uda, Junji; Yamamoto, Tsuneo; and Kosugi, Takumi, 4,515,915, Cl. 524-87.000.

Yamanaka, Hideaki: *See*—
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,515,788, Cl. 514-202.000.

Yamaoka, Tsuguo; and Fukuda, Mitsutoshi, to Toyo Soda Manufacturing Co., Ltd. Photosensitive compositions. 4,515,886, Cl. 430-270.000.

Yamashito, Sachihiro: *See*—
Takeo, Tadashi; Yamamoto, Toru; and Yamashito, Sachihiro, 4,515,521, Cl. 414-735.000.

Yamatsuta, Kohji: *See*—
Okamoto, Hideho; Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,515,866, Cl. 428-614.000.

Yamauchi, Junichi: *See*—
Omura, Ikuo; and Yamauchi, Junichi, 4,515,930, Cl. 526-276.000.

Yamaura, Takemi: *See*—
Yajima, Seishi, deceased; Noda, Akiko, heir; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamaura, Takemi, 4,515,742, Cl. 264-63.000.

Yamazaki, Makoto: *See*—
Uchida, Isamu, deceased; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,516,015, Cl. 235-379.000.

Yamazaki, Shogo, to Yoshida Industry Co., Ltd. Video transfer device. 4,516,171, Cl. 358-214.000.

Yanagihara, Masaki; and Iimura, Takashi, to Trio Kabushiki Kaisha. Variable frequency passband circuit. 4,516,078, Cl. 328-167.000.

Yang, Der C. High speed automatic brick making machine. 4,515,549, Cl. 425-350.000.

Yang, Shu S.; Beattie, Thomas R.; Durette, Philippe L.; Gallagher, Timothy F.; and Shen, Tsung-Ying, to Merck & Co., Inc. Phosphatidyl inositol analogs useful as anti-inflammatory/analgesic agents. 4,515,722, Cl. 260-403.000.

Yanmar Diesel Engine Co., Ltd.: *See*—
Amemori, Koichi; Kawabe, Toshihiko; and Takahashi, Yosuke, 4,515,120, Cl. 123-368.000.

Yano, Masao: *See*—
Miya, Toyofumi; Kobayashi, Yukiharu; and Yano, Masao, 4,515,943, Cl. 536-27.000.

Yano, Takashi, to Ricoh Company, Ltd. Communication network. 4,516,272, Cl. 455-607.000.

Yarwood, John C.: *See*—
Tyler, Derek E.; and Yarwood, John C., 4,515,630, Cl. 75-53.000.

Yasuda, Tomio: *See*—
Wakui, Yoko; Hachino, Hiroaki; Sawahata, Mamoru; Soga, Tasao; Yasuda, Tomio; and Ooue, Michio, 4,516,149, Cl. 357-71.000.

Yasuhara, Seishi, to Nissan Motor Company, Limited. Fuel supply system for diesel engines. 4,515,690, Cl. 210-90.000.

Yasui, Tsuneo, to Brother Kogyo Kabushiki Kaisha. Thermal print head for heat or non-heat-sensitive paper. 4,516,137, Cl. 346-76.0PH.

Yato, Fumihiro; Kitayama, Seishi; and Kurematsu, Akira, to Kokusai Denshin Denwa Co., Ltd. Speech analysis-synthesis system. 4,516,259, Cl. 381-36.000.

Yatsenko, Igor A.: *See*—
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; and Karavaev, Alexandr A., 4,515,157, Cl. 128-303.00R.

Yauger, Jon A.: *See*—
Kwiecinski, Alfred; and Yauger, Jon A., 4,515,086, Cl. 108-96.000.

Yavordios, Dimitri: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,515,944, Cl. 544-91.000.

Yeboah, Yaw D.: *See*—
Sikdar, Subhas K.; and Yeboah, Yaw D., 4,515,936, Cl. 528-200.000.

Yeh, George C. Treatment and separation of petroleums and related materials. 4,515,685, Cl. 208-309.000.

Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,515,988, Cl. 568-586.000.

Yokogawa, Kanae; Kotani, Shozo; Kawata, Shigeo; and Takase, Yoshiyuki, to Dainippon Pharmaceutical Co., Ltd. Process for the production of disaccharide-tripeptide and disaccharide-tetrapeptide. 4,515,891, Cl. 435-69.000.

Yokota, Atsuo: *See*—
Shikama, Takashi; Yamamoto, Tomoyuki; and Yokota, Atsuo, 4,516,054, Cl. 315-71.000.

Yokota, Tsuneshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Output stabilizing device. 4,516,242, Cl. 372-29.000.

Yoneda, Hitoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for forming multicolor image. 4,515,462, Cl. 355-4.000.

Yonemoto, Masashi: *See*—
Kajiyama, Ryuichi; and Yonemoto, Masashi, 4,515,246, Cl. 187-29.00R.

Yonkers, Edward H. Antiglare panel. 4,516,197, Cl. 362-342.000.

York, Billie M., Jr.: *See*—
Cavero, Icilio; Langer, Salomon Z.; and York, Billie M., Jr., 4,515,800, Cl. 514-392.000.

York, Theodore H., to Westinghouse Electric Corp. Coherent phase shift keyed demodulator for power line communication systems. 4,516,079, Cl. 329-104.000.

Yoshida Industry Co., Ltd.: *See*—
Yamazaki, Shogo, 4,516,171, Cl. 358-214.000.

Yoshida, Kiyokazu: *See*—
Nemoto, Michio; Yoshida, Kiyokazu; and Baba, Tetsuro, 4,516,101, Cl. 335-208.000.

Yoshida, Toshihiro: *See*—
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; and Yoshida, Toshihiro, 4,516,180, Cl. 360-126.000.

Yoshihara, Hideo; Ozawa, Akira; Sekimoto, Misao; and Ono, Toshiro, to Nippon Telegraph & Telephone Public Corp. X-Ray lithography mask and method for fabricating the same. 4,515,876, Cl. 430-5.000.

Yoshihara, Kenji: *See*—
Sigiyama, Hiroyuki; Sakurai, Masaki; Abe , Ryozo; and Yoshihara, Kenji, 4,516,161, Cl. 358-342.000.

Yoshikawa, Noriyuki: *See*—
Fujiyama, Kunio; Okamoto, Kei; and Yoshikawa, Noriyuki, 4,515,406, Cl. 297-409.000.

Yoshikawa, Yasuhiko: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; Yoshikawa, Yasuhiko; and Nagashima, Takashi, 4,515,464, Cl. 355-14.00R.

Yoshikoshi, Hideyuki: *See*—
Nakayama, Michio; Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; and Fukuyo, Hiroshi, 4,515,351, Cl. 266-177.000.

Yoshimi, Takani: *See*—
Tsujimura, Isao; and Yoshimi, Takani, 4,514,892, Cl. 29-568.000.

Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Oda, Kengo; Ura, Masaaki; Sato, Naoki; Toyama, Teruhiko; Tachibana, Hajime; Enomoto, Yuji; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, to Mitsui Toatsu Chemicals, Inc. Diphenyl ether derivatives and herbicides containing same. 4,515,628, Cl. 71-111.000.

Yoshimura, Hirofumi: *See*—
Sawatani, Tadashi; Ishii, Mitsuo; Yoshimura, Hirofumi; and Harase, Jirou, 4,515,644, Cl. 148-12.0EA.

Yoshinari, Tsuneo: *See*—
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; and Yoshida, Toshihiro, 4,516,180, Cl. 360-126.000.

Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker with arc light absorber. 4,516,003, Cl. 200-144.00C.

Yoshiyasu, Hajimu: *See*—
Murata, Shirou; Yoshiyasu, Hajimu; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,516,002, Cl. 200-144.00C.

Yoshizawa, Masao: *See*—
Sakakibara, Mitsuhiko; Yoshizawa, Masao; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,515,922, Cl. 525-99.000.

Young, James R., to General Electric Company. Hydrocarbon getter pump. 4,515,528, Cl. 417-51.000.

Yukon Energy Corporation: *See*—
Tallman, William R.; McDevitt, Steven C.; and Delancey, Warren H., 4,515,145, Cl. 126-99.00A.

Zabala, Robert J.: *See*—
Park, Dong-Sil; and Zabala, Robert J., 4,515,865, Cl. 428-610.000.

Zach, Elmer S. Ventilation air control unit. 4,515,071, Cl. 98-55.000.

Zahn, Robert L., to United States of America, Air Force. Variable radius lead former. 4,515,001, Cl. 72-323.000.

Zanetti, Guido: *See*—
Kompis, Ivan; Rey-Bellet, Gerald; and Zanetti, Guido, 4,515,948, Cl. 544-325.000.

Zapisek, John M.; and Giulekas, Gus, to Standard Microsystems Corporation. High-speed merged plane logic function array. 4,516,040, Cl. 307-468.000.

Zecher, Wilfried; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of fumaric acid monoesters. 4,515,974, Cl. 549-372.000.

Zeiler, Hans-Joachim: *See*—
Metzger, Karl G.; Schrock, Wilfried; Habich, Dieter; Naab, Paul; and Zeiler, Hans-Joachim, 4,515,789, Cl. 514-196.000.

Zeller Corporation, The: *See*—
Mazziotti, Philip J., 4,515,574, Cl. 464-131.000.

Zellner, Robert J., to McGean-Rohco, Inc. Method for the production of antimony oxide. 4,515,765, Cl. 423-617.000.

Zemanek, Joseph, Jr., to Mobil Oil Corporation. Acoustic well logging device for detecting compressional and shear waves. 4,516,228, Cl. 367-75.000.

Zenith Electronics Corporation: *See*—
Skerlos, Peter C., 4,516,170, Cl. 358-191.100.

Zett, John A.: *See*—
Barclay, Thomas E.; and Zett, John A., 4,516,248, Cl. 375-76.000.

Zeugner, Horst: *See*—
Heinemann, Henning; Jasserand, Daniel; Milkowski, Wolfgang; Yavordios, Dimitri; and Zeugner, Horst, 4,515,944, Cl. 544-91.000.

Zifferer, Lothar R., to Packless Metal Hose, Inc. Tube corrugating die. 4,514,997, Cl. 72-68.000.

Zimmerman, Barbara F.: *See*—
Rawls, Henry R.; Querens, Allan E.; and Zimmerman, Barbara F., 4,515,910, Cl. 523-115.000.

Zimmerman, Heinz: *See*—
Wernicke, Hans J.; and Zimmerman, Heinz, 4,515,678, Cl. 208-10.000.

Zimmermann, Eugene L.; and Kania, Don R., to United States of America, Energy. Fast shutter apparatus. 4,515,173, Cl. 137-68.00R.

Zinsmeyer, Thomas M., to Carrier Corporation. Variable speed drive motor system with inverter control. 4,514,991, Cl. 62-209.000.

Zuckermann, Erno : *See*—
Gillemot, Laszlo ; Prodan, Janos; Pataki, Endre; and Zuckermann, Erno , 4,515,497, Cl. 403-391.000.

Zwick, David J., to Coleman Company, Inc., The. Wheel lock and stand assembly for trailer. 4,515,394, Cl. 280-764.100.

Zyma SA: *See*—
Marti, Erwin; Heiber, Oskar; Gumma, Alexandre; Huber, Gustave; Utsumi, Isamu; Nakagawa, Hiroshi; Miyata, Tatsuhiko; and Akimoto, Koichi, 4,515,804, Cl. 514-456.000.

501 Etablissement Public dit "Centre National d'Exploitation des Oceans" (CNEXO): *See*—
Hue, Jean-Pierre, 4,515,013, Cl. 73-170.00A.

501 Maco Meudon Chemin de Genas: *See*—
Segonne, Jean-marc, 4,515,515, Cl. 417-26.000.

501 Telecommunications Radioelectriques et Telephoniques: *See*—
Boudault, Robert, 4,516,086, Cl. 332-16.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF MAY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allied Corporation: *See—*
Ritsema, Irving R., Re. 31,878, Cl. 188-71.800.

Lubbers, Dietrich W.; and Opitz, Norbert, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method and arrangement for measuring the concentration of gases. Re. 31,879, Cl. 436-133.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Lubbers, Dietrich W.; and Opitz, Norbert, Re. 31,879, Cl. 436-133.000.

Nomura, Kazuhiki, to Yamaha Hatsudoki Kabushiki Kaisha. Air intake conduitry for a motorcycle. Re. 31,877, Cl. 180-219.000.

Opitz, Norbert: *See—*
Lubbers, Dietrich W.; and Opitz, Norbert, Re. 31,879, Cl. 436-133.000.

Ritsema, Irving R., to Allied Corporation. Disc brake having a piston retraction assembly. Re. 31,878, Cl. 188-71.800.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Nomura, Kazuhiki, Re. 31,877, Cl. 180-219.000.

LIST OF DESIGN PATENTEES

Adachi, Koushirou; Nishiwaki, Katsuhiko; Sakamoto, Motoake; Tsukaguchi, Tamotsu; and Miyamoto, Mitsuo, to Hitachi, Ltd. Central processor unit. 278,712, 5-7-85, Cl. D14-102.000.

American Commercial, Incorporated: *See—*
Laslo, Larry R., 278,678, Cl. D7-137.000.
Seibel, Ben, 278,672, Cl. D7-13.000.

American Standard Inc.: *See—*
Stairs, Henry M., Jr., 278,742, Cl. D23-55.000.

Andersson, Bengt-Goran; and Liljenborg, Gert. Winch. 278,754, 5-7-85, Cl. D34-33.000.

Andrus, Julia, to Authentica, Inc. Window jewel. 278,694, 5-7-85, Cl. D11-117.000.

Andrus, Julia, to Authentica, Inc. Window jewel. 278,695, 5-7-85, Cl. D11-117.000.

AT&T Bell Laboratories: *See—*
Duell, Randall S.; Kulpa, Steven H.; Maguire, Justin M., Jr.; Schoneck, Alan C.; and Sylvester, Gordon E., 278,711, Cl. D14-102.000.

Authentica, Inc.: *See—*
Andrus, Julia, 278,694, Cl. D11-117.000.
Andrus, Julia, 278,695, Cl. D11-117.000.

Bachmann, G. Merle; Davis, Charles L.; Morgan, Annis R., Jr.; Shelton, Walter L.; and Hughes, Robert D., IV, to Coca-Cola Company, The. Vending machine. 278,724, 5-7-85, Cl. D20-4.000.

Becker, James F.; and Mayer, Andrew S. Children's book. 278,722, 5-7-85, Cl. D19-28.000.

Biesecker, Frederick N., to Drug Plastics & Glass Company, Inc. Bottle. 278,683, 5-7-85, Cl. D9-410.000.

Black & Decker, Inc.: *See—*
Shalvoy, John C.; and Van Deursen, Gary E., 278,752, Cl. D32-70.000.

Blackburn, James R. Pannier carrier for the front wheel of a bicycle. 278,699, 5-7-85, Cl. D12-158.000.

Bolgert, Edwin F., to Kohler Co. Vacuum breaker valve. 278,740, 5-7-85, Cl. D23-19.000.

Borden, William K. Car top carrier for clothing articles, cargo and the like. 278,698, 5-7-85, Cl. D12-157.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,719, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,720, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,721, Cl. D18-1.000.

Brown, Dwight C. Retainer accessory for garment hangers. 278,665, 5-7-85, Cl. D6-328.000.

Brownline Pipe, Inc.: *See—*
Galloway, Cecil, 278,739, Cl. D23-19.000.

Brussing, Bernd: *See—*
Zeischegg, Walter, deceased; Zeischegg, Rosalinde, heiress; and Brussing, Bernd, 278,663, Cl. D6-476.000.

Burket, Kenneth A.; and Koenig, Gerhard F., to Corning Glass Works. Shade or the like. 278,748, 5-7-85, Cl. D26-132.000.

Calumet Manufacturing Co.: *See—*
Seager, Richard H., 278,751, Cl. D28-76.000.

Caroselli, Lee R. Sign board. 278,725, 5-7-85, Cl. D20-42.000.

Cavalla, Inc.: *See—*
Pisani, Arthur; and Pisani, Robert, 278,750, Cl. D28-4.000.

Central Koyo Co., Ltd.: *See—*
Takahashi, Mitsuo, 278,745, Cl. D24-13.000.

Chiodo, Daniel J.; Pardon, Barry; and Verga, Joseph, to General Electric Company. Multiple battery charger. 278,702, 5-7-85, Cl. D13-5.000.

Chiodo, Daniel J.; Pardon, Barry; and Verga, Joseph, to General Electric Company. Multiple battery charger. 278,703, 5-7-85, Cl. D13-5.000.

Claxton, Bruce A.; and Ramos, Sylvia, to Motorola, Inc. Multiple battery charging unit or similar article. 278,704, 5-7-85, Cl. D13-5.000.

Coats & Clark, Inc.: *See—*
Dunn, James R., 278,723, Cl. D19-91.000.
McKibben, Jerry, 278,718, Cl. D17-9.000.

Coca-Cola Company, The: *See—*
Bachmann, G. Merle; Davis, Charles L.; Morgan, Annis R., Jr.; Shelton, Walter L.; and Hughes, Robert D., IV, 278,724, Cl. D20-4.000.

Cohorst, Timothy J.; and Haupt, Ruth R. Inflatable plush toy figures. 278,731, 5-7-85, Cl. D21-148.000.

Colgate-Palmolive Company: *See—*
Prahs, Harald, 278,681, Cl. D9-378.000.

Cooperative Marketing Co., The: *See—*
Villanueva, Jesus R., 278,679, Cl. D8-373.000.

Corning Glass Works: *See—*
Burket, Kenneth A.; and Koenig, Gerhard F., 278,748, Cl. D26-132.000.

Cromemco Inc.: *See—*
Xanthopoulus, Eric G., 278,709, Cl. D14-100.000.

Da Mart, Charles E.: *See—*
Decker, David E., 278,673, Cl. D7-77.000.

Davis, Charles L.: *See—*
Bachmann, G. Merle; Davis, Charles L.; Morgan, Annis R., Jr.; Shelton, Walter L.; and Hughes, Robert D., IV, 278,724, Cl. D20-4.000.

DeAre, David W., to Wilton Enterprises, Inc. Cake support pillar. 278,676, 5-7-85, Cl. D7-83.000.

Decker, David E., to Da Mart, Charles E. Bottle cooler. 278,673, 5-7-85, Cl. D7-77.000.

Drug Plastics & Glass Company, Inc.: *See—*
Biesecker, Frederick N., 278,683, Cl. D9-410.000.

Duell, Randall S.; Kulpa, Steven H.; Maguire, Justin M., Jr.; Schoneck, Alan C.; and Sylvester, Gordon E., to AT&T Bell Laboratories. Computer housing. 278,711, 5-7-85, Cl. D14-102.000.

Dunn, James R., to Coats & Clark, Inc. Appointment memo holder. 278,723, 5-7-85, Cl. D19-91.000.

Epson Corp.: *See—*
Maruyama, Naoyuki, 278,714, Cl. D14-111.000.

Exxon Research and Engineering Co.: *See—*
Juliana, Vincent A., 278,713, Cl. D14-111.000.

F. Lli Guzzini S.p.A.: *See—*
Guzzini, Silvio, 278,680, Cl. D9-352.000.

Fairchild Industries, Inc.: *See—*
Powers, Sidney A.; Rosenthal, Gordon; and Stirling, William V., 278,700, Cl. D12-342.000.

Fay, Andreas, to Lever Brothers Company. Toothbrush. 278,662, 5-7-85, Cl. D4-104.000.

Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Drawer. 278,664, 5-7-85, Cl. D6-510.000.

Fox, Geoffrey T., to Moto-X Fox, Inc. Glove. 278,660, 5-7-85, Cl. D2-373.000.

Fukasawa, Naoto: *See—*
Suzuki, Susumu; Uchihori, Noritaka; and Fukasawa, Naoto, 278,685, Cl. D10-38.000.

Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,719, 5-7-85, Cl. D18-1.000.

Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,720, 5-7-85, Cl. D18-1.000.

Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,721, 5-7-85, Cl. D18-1.000.

Galloway, Cecil, to Brownline Pipe, Inc. Non-drain valve. 278,739, 5-7-85, Cl. D23-19.000.
Gelsen, Ralf, to MAPA GmbH Gummi- und Plastikwerke. Children's tooth brush. 278,661, 5-7-85, Cl. D4-104.000.
General Electric Company: *See*—
Chiodo, Daniel J.; Pardon, Barry; and Verga, Joseph, 278,702, Cl. D13-5.000.
Chiodo, Daniel J.; Pardon, Barry; and Verga, Joseph, 278,703, Cl. D13-5.000.
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36 4,514,918

CLASS 40

159 4,514,919
448 4,514,920

CLASS 42

1 V 4,514,921
50 4,514,922
69 R 4,514,923

CLASS 43

9 4,514,924
12 4,514,925
17.2 4,514,926
44.98 4,514,927
57.2 4,514,928

CLASS 44

19 4,515,601
51 4,515,602
62 4,515,603

CLASS 47

17 4,514,929
60 4,514,930

CLASS 48

197 R 4,515,604

CLASS 49

21 4,514,931
50 4,514,932

CLASS 51

32 4,514,933
165 R 4,514,934
4,514,935
270 4,514,936
281 SF 4,514,937

CLASS 52

79.4 4,514,938
118 4,514,939
126.1 4,514,940
167 4,514,941
4,514,942
200 4,514,943
4,514,944
202 4,514,945
211 4,514,946
397 4,514,948
536 4,514,947
585 4,514,949
648 4,514,950
660 4,514,951
713 4,514,952

CLASS 53

52 4,514,953
53 4,514,954
64 4,514,955
148 4,514,956
252 4,514,957
266 R 4,514,958
428 4,514,959
440 4,514,960
449 4,514,961
457 4,514,962
493 4,514,963
540 4,514,964
553 4,514,965
585 4,514,966

CLASS 55

26 4,515,605
159 4,515,606
166 4,515,607
193 4,515,608
270 4,515,609

CLASS 56

14.7 4,514,967
341 4,514,968
4,514,969
400.12 4,514,970

CLASS 57

9 4,514,971
301 4,514,972
4,514,973
401 4,514,974
4,514,975

CLASS 60

39.07 4,514,976
398 4,514,977
426 4,514,978
512 4,514,979
534 4,514,980
547.1 4,514,981
562 4,514,982
4,514,983
585 4,514,984
589 4,514,985
605 4,514,986

CLASS 62

6 4,514,987
82 4,514,988
201 4,514,989
209 4,514,991
235 4,514,992
238.7 4,514,990
372 4,514,993
389 4,514,994

CLASS 65

2 4,515,610
4,515,611
3.12 4,515,612
4.4 4,515,613
29 4,515,614
171 4,515,621
351 4,515,622

CLASS 66

170 4,514,995

CLASS 70

100 4,514,996

CLASS 71

12 4,515,623
54 4,515,615
76 4,515,616
4,515,617
88 4,515,618
90 4,515,619
91 4,515,620
92 4,515,624
4,515,625
93 4,515,626
95 4,515,627
111 4,515,628

CLASS 72

68 4,514,997
184 4,514,998
202 4,514,999
278 4,515,000
323 4,515,001
339 4,515,002
370 4,515,003
388 4,515,004
391 4,515,005
402 4,515,006

CLASS 73

38 4,515,007
53 4,515,008
118 4,515,009
151 4,515,010
4,515,011
168 4,515,012
170 A 4,515,013
202 4,515,014
304 C 4,515,015
517 R 4,515,016
618 4,515,017
637 4,515,018
756 4,515,019
761 4,515,020
861.27 4,515,021
861.79 4,515,022
864.51 4,515,023

CLASS 74

10.33 4,515,024
27 4,515,025
63 4,515,026
87 4,515,027
191 4,515,028
339 4,515,029
348 4,515,030
359 4,515,031
473 R 4,515,032
476 4,515,033
501 R 4,515,034
4,515,035
535 4,515,036
553 4,515,037
606 R 4,515,038
665 C 4,515,039
866 4,515,040
4,515,041

CLASS 75

0.5 B 4,515,629
53 4,515,630
73 4,515,631

CLASS 81

55 4,515,042
57.22 4,515,043
61 4,515,044
429 4,515,045
436 4,515,046

CLASS 82

1 C 4,515,047
36 R 4,515,049

CLASS 83

13 4,515,048
71 4,515,050
146 4,515,051
479 4,515,052
488 4,515,053
663 4,515,054
835 4,515,055

CLASS 84

1.01 4,515,056
1.03 4,515,057
1.24 4,515,058
306 4,515,059
380 R 4,515,060
394 4,515,061
403 4,515,062

CLASS 86

27 4,515,063

CLASS 89

128 4,515,064

CLASS 91

363 A 4,515,065
454 4,515,066
506 4,515,067

CLASS 98

1 4,515,068
40 D 4,515,069
42.07 4,515,070
55 4,515,071
115.2 4,515,072
4,515,073

CLASS 99

393 4,515,074
519 4,515,075
571 4,515,076

CLASS 101

127 4,515,077
157 4,515,078
183 4,515,079

CLASS 102

205 4,515,080
266 4,515,081
293 4,515,082
493 4,515,083

CLASS 104

166 4,515,084
250 4,515,085

CLASS 106

18.16 4,515,632
18.26 4,515,633
35 4,515,634
90 4,515,635
4,515,636
162 4,515,638
287.25 4,515,640
288 Q 4,515,639

CLASS 108

96 4,515,086
147 4,515,087

CLASS 110

110 4,515,088
235 4,515,089
264 4,515,090
346 4,515,091
347 4,515,092
4,515,093
4,515,094
4,515,095

CLASS 112

79 R 4,515,096
262.3 4,515,097
274 4,515,098
279 4,515,099

CLASS 114

97 4,515,100
162 4,515,101
344 4,515,102

CLASS 118

218 4,515,103
500 4,515,104
629 4,515,105
651 4,515,106
718 4,515,107

CLASS 119

45 R 4,515,108

CLASS 122

32 4,515,109

CLASS 123

41.37 4,515,110
41.61 4,515,111
41.84 4,515,112
48 B 4,515,114
48 C 4,515,113
52 M 4,515,115
90.43 4,515,116
146.5 A 4,515,117
149 C 4,515,118
198 E 4,515,119
4,515,122
198 F 4,515,121
222 4,515,123
324 4,515,124
359 4,515,125
368 4,515,120
401 4,515,126
430 4,515,127
454 4,515,128
472 4,515,129
491 4,515,131
493 4,515,130
494 4,515,132
538 4,515,133
557 4,515,134
4,515,135
564 4,515,136
572 4,515,137
590 4,515,138
599 4,515,139
603 4,515,140
647 4,515,141

CLASS 124

23 R 4,515,142

CLASS 126

21 A 4,515,143
58 4,515,144
99 A 4,515,145
140 4,515,146
163 R 4,515,147
438 4,515,148
442 4,515,149
445 4,515,150
450 4,515,151

CLASS 128

75 4,515,152
4,515,153
92 EB 4,515,154
134 4,515,155
202.26 4,515,156
303 R 4,515,157
419 PG 4,515,159
4,515,160
4,515,161
419 R 4,515,158
640 4,515,162
660 4,515,163
663 4,515,164
664 4,515,165
694 4,515,166
736 4,515,167
741 4,515,168
746 4,515,169

CLASS 131

336 4,515,170

CLASS 132

42 R 4,515,171

CLASS 133

8 A 4,515,172

CLASS 134

5 4,515,641

CLASS 137

68 R 4,515,173
72 4,515,174
107 4,515,175
115 4,515,176
318 4,515,177
393 4,515,178
543.13 4,515,179
565 4,515,180
596 4,515,181
614.06 4,515,182
625.21 4,515,183
625.66 4,515,184

CLASS 139

446 4,515,185
455 4,515,186

CLASS 141

1 4,515,187
4,515,188
11 4,515,189
131 4,515,190

CLASS 144

1 C 4,515,191
2 Z 4,515,192
172 4,515,193
193 A 4,515,194
366 4,515,195
378 4,515,196

CLASS 148

1.5 4,515,642
6.15 Z 4,515,643
12 EA 4,515,644
16 4,515,645

CLASS 152

209 R 4,515,197
223 4,515,198
353 R 4,515,199

CLASS 156

78 4,515,646
91 4,515,647
196 4,515,648
244.11 4,515,649
423 4,515,651
622 4,515,650
643 4,515,652
4,515,653
656 4,515,654

CLASS 157

13 4,515,200

CLASS 160

174 4,515,201
332 4,515,202

CLASS 162

57 4,515,655
101 4,515,656
164.3 4,515,657
168.4 4,515,658

CLASS 164

468 4,515,203
483 4,515,204

CLASS 165

1 4,515,205
4,515,206
4,515,207
43 4,515,208
104.22 4,515,209
133 4,515,210

CLASS 166

77 4,515,211
99 4,515,212
123 4,515,213
250 4,515,214
272 4,515,215
293 4,515,216
297 4,515,217
328 4,515,218
374 4,515,219
384 4,515,220

CLASS 172

3 4,515,221
68 4,515,222
372 4,515,223
572 4,515,224

CLASS 174

65 SS 4,515,991
102 R 4,515,992
4,515,993

CLASS 175

40 4,515,225
57 4,515,226
65 4,515,227
313 4,515,228
337 4,515,229
410 4,515,230

CLASS 177

25 4,515,231
154 4,515,232

CLASS 179

2 R 4,515,994
6.13 4,515,995
81 B 4,515,996
111 R 4,515,997
146 R 4,515,998

CLASS 180

68.5 4,515,233
89.12 4,515,234
165 4,515,235
219 Re.31,877
227 4,515,236
287 4,515,237

CLASS 181

30 4,515,238
290 4,515,239

CLASS 182

6 4,515,240
96 4,515,241
106 4,515,242
155 4,515,243
230 4,515,244

CLASS 184

105 R 4,515,245

CLASS 187

29 R 4,515,246
4,515,247
67 4,515,248

CLASS 188

71.8 Re.31,878
73.38 4,515,249
79.5 GT 4,515,250
171 4,515,251
282 4,515,252
314 4,515,253
371 4,515,254

CLASS 192

0.075 4,515,257
3 H 4,515,259
3.57 4,515,255
18 R 4,515,256
91 A 4,515,258

CLASS 193

44 4,515,260

CLASS 194

1 A 4,515,261
1 D 4,515,263
1 G 4,515,262

CLASS 198

344 4,515,264
821 4,515,265

CLASS 200

5 A 4,515,999
44 4,516,000
61.54 4,516,001
144 B 4,516,004
144 C 4,516,002
4,516,003
147 R 4,516,005
148 A 4,516,006

CLASS 201

2.5 4,515,659

CLASS 202

241 4,515,660

CLASS 203

60 4,515,661

CLASS 204

15 4,515,662
44.2 4,515,663
62 4,515,664
98 4,515,665
159.2 4,515,666
162 R 4,515,667
192 D 4,515,668
196 4,515,669
199 4,515,670
228 4,515,671
269 4,515,672
290 F 4,515,673
292 4,515,674
298 4,515,675
299 R 4,515,676
300 EC 4,515,677

CLASS 206

205 4,515,266
219 4,515,267
305 4,515,268
334 4,515,269
438 4,515,270
519 4,515,271
592 4,515,272
604 4,515,273

CLASS 208

10 4,515,678
11 R 4,515,679
87 4,515,680
111 4,515,681
4,515,682
113 4,515,683
180 4,515,684
309 4,515,685

CLASS 209

3.1 4,515,274
139 A 4,515,686
167 4,515,687
4,515,688
453 4,515,689
558 4,515,275
693 4,515,276

CLASS 210

90 4,515,690
274 4,515,691
278 4,515,692
402 4,515,693
531 4,515,694
634 4,515,695
713 4,515,696
768 4,515,697
802 4,515,698

CLASS 211

45 4,515,277
107 4,515,278
153 4,515,279
189 4,515,280

CLASS 212

76 4,515,281
254 4,515,282

CLASS 215

270 4,515,283

CLASS 219

10.55 D 4,516,007
69 P 4,516,009
109 4,516,008
121 LJ 4,516,010
222 4,516,011
400 4,516,012

CLASS 220

70 4,515,284
288 4,515,285
314 4,515,286
316 4,515,287

CLASS 221

1 4,515,288
13 4,515,289
124 4,515,290
211 4,515,291

CLASS 222

52 4,515,292
95 4,515,293
105 4,515,294
113 4,515,295
134 4,515,296
160 4,515,297
380 4,515,298

CLASS 223

76 4,515,299

CLASS 224

151 4,515,300
204 4,515,301

CLASS 227

58 4,515,302
131 4,515,303

CLASS 228

136 4,515,304
173.2 4,515,305

CLASS 235

78 R 4,516,013
101 4,516,014
379 4,516,015
472 4,516,016
4,516,017

CLASS 236

9 A 4,515,306
25 R 4,515,307
49 4,515,308

CLASS 238

349 4,515,309

CLASS 239

8 4,515,310
172 4,515,311
227 4,515,312
455 4,515,313
466 4,515,314
491 4,515,315

CLASS 241

5 4,515,316
4,515,317
28 4,515,318
284 4,515,319

CLASS 242

18 DD 4,515,320
56 R 4,515,321
71.8 4,515,322
74.1 4,515,323
84.1 A 4,515,324
84.51 R 4,515,325
107.4 A 4,515,326
118.3 4,515,327
131 4,515,328
157.1 4,515,329
197 4,515,330
199 4,515,331

CLASS 248

37.3 4,515,332
122 4,515,333
146 4,515,334
231.5 4,515,335
288.3 4,515,336
371 4,515,337
460 4,515,338
543 4,515,339

CLASS 249

96 4,515,340
106 4,515,341
122 4,515,342

CLASS 250

203 R 4,516,018
214 L 4,516,020
214 RC 4,516,019
227 4,516,021
4,516,022
235 4,516,023
236 4,516,024
252.1 4,516,025
310 4,516,026
338 4,516,027
370 4,516,028
442.1 4,516,029
492.2 4,516,030
562 4,516,031
578 4,516,032

CLASS 251

48 4,515,343
141 4,515,345
328 4,515,347
337 4,515,346
635 4,515,344

CLASS 252

8.55 D 4,515,701
8.55 R 4,515,699
4,515,700
49.6 4,515,702
92 4,515,703
135 4,515,704
174.12 4,515,705
301.4 H 4,515,706
368 4,515,707
390 4,515,708
509 4,515,709
511 4,515,710
522 R 4,515,711
4,515,712

CLASS 254

28 4,515,348

CLASS 256

1 4,515,349

CLASS 260

106 4,515,713
112 R 4,515,714
112.5 R 4,515,715
239 A 4,515,717
4,515,719
239 B 4,515,718
351.1 4,515,720
400 4,515,721
403 4,515,722
404.5 4,515,723
410 4,515,724
410.7 4,515,725
412.4 4,515,726
413 4,515,727
429 CY 4,515,728
464 4,515,729
465 D 4,515,730
4,515,731
465.6 4,515,732
988 4,515,733

CLASS 261

50 R 4,515,734
111 4,515,735

CLASS 264

4.3 4,515,736
22 4,515,737
40.7 4,515,738
45.3 4,515,739
50 4,515,740
62 4,515,741
63 4,515,742
135 4,515,743
171 4,515,744
211 4,515,745
332 4,515,746

CLASS 266

92 4,515,350
177 4,515,351
218 4,515,352
236 4,515,353

CLASS 269

15 4,515,354
234 4,515,355

CLASS 270

53 4,515,356

CLASS 271

120 4,515,357
122 4,515,358

CLASS 272

1 A 4,515,360
1 R 4,515,359
93 4,515,361
114 4,515,362
118 4,515,363
143 4,515,364

CLASS 273

25 4,515,365
143 R 4,515,366
149 R 4,515,367
186 A 4,515,368
243 4,515,369
258 4,515,370
260 4,515,371
274 4,515,372
317 4,515,373
359 4,515,374

CLASS 277

1 4,515,375
9.5 4,515,376
27 4,515,377
152 4,515,378

CLASS 280

11.27 4,515,379
93 4,515,380
96 4,515,381
221 4,515,382
242 WC 4,515,383
276 4,515,384
289 G 4,515,386
289 WC 4,515,385
478 A 4,515,387
605 4,515,388
642 4,515,389
675 4,515,390
690 4,515,391
755 4,515,392
756 4,515,393
764.1 4,515,394
808 4,515,395

CLASS 281

15 R 4,515,396

CLASS 285

47 4,515,397
59 4,515,398
95 4,515,399
141 4,515,400

CLASS 290

54 4,516,033

CLASS 292

170 4,515,401

CLASS 294

19.2 4,515,402
86.31 4,515,403

CLASS 296

65 R 4,515,404
78.1 4,515,405

CLASS 297

409 4,515,406
429 4,515,407

CLASS 299

37 4,515,408
43 4,515,409
4,515,410

CLASS 300

132 4,516,181

CLASS 301

9 TV 4,515,411

CLASS 303

6 R 4,515,412

CLASS 307

10 R 4,516,034
66 4,516,035
228 4,516,036
252 A 4,516,037
264 4,516,038
455 4,516,039
468 4,516,040
494 4,516,041
546 4,516,042

CLASS 308

3 R 4,515,414
6 C 4,515,413
4,515,416
6 R 4,515,415

CLASS 310

11 4,516,043
64 4,516,044
68 E 4,516,045
154 4,516,046
230 4,516,047
254 4,516,048
313 A 4,516,049

CLASS 312

7.1 4,515,419
12 4,515,420
351 4,515,421

CLASS 313

359.1 4,516,050
446 4,516,051
546 4,516,052
584 4,516,053

CLASS 315

71 4,516,054
151 4,516,055
240 4,516,056
260 4,516,057
370 4,516,058

CLASS 318

301 4,516,059
341 4,516,060
561 4,516,061
676 4,516,062
685 4,516,063
696 4,516,064
811 4,516,065

CLASS 320

15 4,516,066

CLASS 323

265 4,516,067

CLASS 324

54 4,516,068
71.1 4,516,069
117 R 4,516,070
158 F 4,516,072
158 R 4,516,071
244 4,516,073
309 4,516,074
4,516,075
418 4,516,076
425 4,516,077

CLASS 328

167 4,516,078

CLASS 329

104 4,516,079

CLASS 330

3 4,516,080
254 4,516,081
296 4,516,082

CLASS 331

1 A 4,516,083
2 4,516,084
40 4,516,085

CLASS 332

16 R 4,516,086
17 4,516,087

CLASS 333

22 F 4,516,088
135 4,516,089
141 4,516,090
161 4,516,091
184 4,516,092
193 4,516,093
194 4,516,094
4,516,095
219 4,516,096
261 4,516,097

CLASS 335

35 4,516,098
135 4,516,099
160 4,516,100
208 4,516,101
267 4,516,102

CLASS 336

65 4,516,103
206 4,516,104

CLASS 338

21 4,516,105
28 4,516,106
89 4,516,107
319 4,516,108

CLASS 339

17 C 4,515,422
28 4,515,423
42 4,515,426
75 MP 4,515,424
4,515,425
177 E 4,515,427

CLASS 340

114 B 4,516,109
323 R 4,516,110
347 DA 4,516,111
365 R 4,516,112
384 E 4,516,113
542 4,516,114
556 4,516,115
685 4,516,116
4,516,117
703 4,516,118
722 4,516,119
785 4,516,120
825.05 4,516,121
825.5 4,516,122
825.86 4,516,123
960 4,516,124

CLASS 343

7.7 4,516,125
383 4,516,126
702 4,516,127
761 4,516,128
772 4,516,129
781 P 4,516,130
785 4,516,131
815 4,516,132
819 4,516,133

CLASS 346

75 4,516,134
76 PH 4,516,135
4,516,136
4,516,137
80 4,516,138

140 R 4,516,139
4,516,140
153.1 4,516,141
160 4,516,142

CLASS 350

96.12 4,515,428
96.13 4,515,429
4,515,430
96.15 4,515,431
96.20 4,515,432
96.21 4,515,433
4,515,434
96.23 4,515,435
96.33 4,515,436
114 4,515,437
255 4,515,438
257 4,515,439
334 4,515,440
395 4,515,441
396 4,515,443
397 4,515,442
413 4,515,444
427 4,515,446
524 4,515,445
527 4,515,447

CLASS 351

41 4,515,448
156 4,515,449

CLASS 353

5 4,515,450
120 4,515,451

CLASS 354

106 4,515,452
149.1 4,515,453
287 4,515,454
293 4,515,455
320 4,515,456
443 4,515,457

CLASS 355

3 FU 4,515,459
3 SH 4,515,458
3 TR 4,515,460
4,515,461
4 4,515,462
10 4,515,463
14 C 4,515,465
14 R 4,515,464
15 4,515,466
4,515,467
27 4,515,468
35 4,515,469
105 4,515,470

CLASS 356

5 4,515,471
4,515,472
33 4,515,473
44 4,515,474
73.1 4,515,475
318 4,515,476
338 4,515,477
345 4,515,478
375 4,515,479
400 4,515,480
4,515,481

CLASS 357

23.4 4,516,143
27 4,516,144
42 4,516,145
52 4,516,146
59 4,516,147
68 4,516,148
71 4,516,149

CLASS 358

13 4,516,150
14 4,516,151
29 4,516,152
31 4,516,153
44 4,516,154
80 4,516,155
85 4,516,156
108 4,516,157
109 4,516,158
160 4,516,167
190 4,516,168
4,516,169
191.1 4,516,170
214 4,516,171
228 4,516,172
261 4,516,173
282 4,516,174
283 4,516,175
293 4,516,159
326 4,516,160
342 4,516,161

CLASS 360

25 4,516,162
32 4,516,163
53 4,516,164
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71 4,516,183
152 4,516,184
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154 4,515,780
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195 4,515,546
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406 4,515,551
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	335	278,668
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		278,721
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DESIGN PATENTS

06 :	278,660		278,731	12 :	278,684	18 :	278,747		278,744		278,748
	278,666		278,737		278,702	20 :	278,671	33 :	278,734	40 :	278,690
	278,669		278,739		278,703	21 :	278,698	34 :	278,677	42 :	278,683
	278,673		278,743		278,704		278,741		278,738		278,713
	278,689	08 :	278,668	13 :	278,724	25 :	278,749		278,742	45 :	278,718
	278,691		278,670	17 :	278,664	26 :	278,697		278,750	49 :	278,694
	278,699		278,725		278,676	27 :	278,667	36 :	278,672		278,695
	278,707	09 :	278,723		278,679		278,753		278,678	51 :	278,665
	278,709		278,751		278,708	29 :	278,736		278,700	55 :	278,740
	278,722		278,752		278,711						

PLANT PATENTS

06 :	5,458					
	5,459	5,460	5,461	5,462	5,463	5,465

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

01 :	T105,404	36 :	T105,402	T105,403							

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